

FOOD ENGINEERING

A CHILTON PUBLICATION

DECEMBER 1968



Wagner expands gourmet line, makes packages appealing, increases quality distribution to boost sales.

THIS ISSUE

Rejuvenates Old Gourmet Food Business	59
Pepsi Can Line Runs at 1,000 Per Min	68
How to Get the Most Out of Milk Solids	74

**There's One Sanitary
Pump designed for easy
take-down or
full CIP cleaning.**

 Tri-Flo can save you hours of valuable processing time because it's built for fast, easy take-down, without tools.

Tri-Flo is available in 5 models. Two models, the series S and US can be cleaned in place by remote control, without dismantling. Capacities to 1150 gpm. Seals to suit 99% of applications. Base mounted or close coupled styles available and port connections include:

- Tri-Clamp®
- Tri-Weld®
- Bevel Seat

Send for 40 page Catalog TF66. Provides full details including capacity curves.



P-368

TRI-FLO



LADISH CO., Tri-Clover Division • Kenosha, Wisconsin 53140

International Equipment News

Elevating Screw Conveyors

Ease of cleaning, large capacity are among big advantages of screw conveyors for elevating powdered or granular free-flowing materials. Machines are sectional and can be dismantled into three parts in seconds. They can be supplied in any length required, have outputs from 1 cwt to 15-tons/hr, depending on tube dia., screw speed, type of material handled.—*Helix Conveyors, Braughing, England.*

Circle 280 on Inquiry Card

Versatile Overwrap Machine

Ease and speed of size change, plus twin gripper film feed that enables handling of such ma-

terials as coated polypropylene, are outstanding features of a new overwrap machine. Available in two basic models covering a speed range of 40-75 pkgs/min, units can be supplied for in-line, or with right- or left-hand infeed. Maximum web width is 14-in., cut-off length to 22-in.—*Auto Wrappers Ltd., Norwich, England.*

Circle 281 on Inquiry Card

Caravello and Fouche Acquired by Manurhin

The Equipment for Food Industries department of Ameliorair, makers of Caravello and Fouche processing units, has been acquired by Societe Manurhin Manufacture de Machines du Haut-

For more data, circle item numbers on card at back of issue.

Freeze-dry the Atlas way

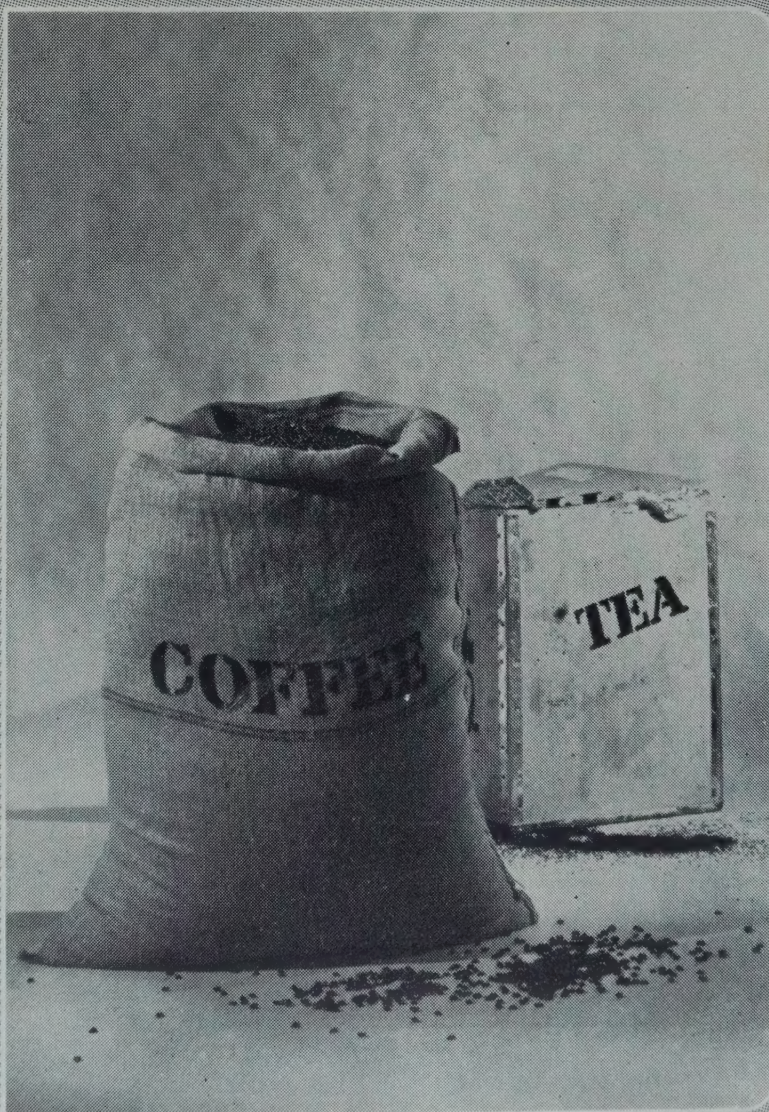
Suppliers of complete production plants for freeze drying of vegetables, fruit, meat, fish, mushrooms, coffee and tea.

Please write for further information.



ATLAS

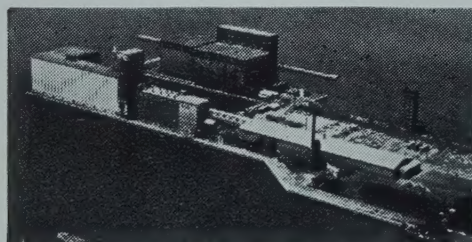
3, BALDERSGADE · 2200 COPENHAGEN N · DENMARK



BULK

INTERNATIONAL

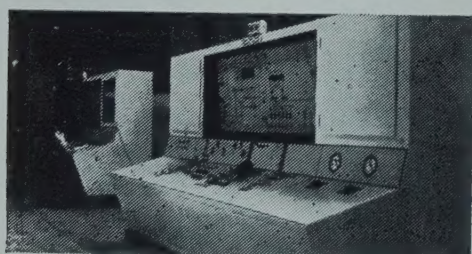
Specialised bulk handling installations designed and built by Simon for the flour milling, biscuit and bread baking industries are to be found throughout the world. Food processors now realise the benefits that handling in bulk brings. And most of them see Simon first, to take advantage of the competent professional approach, the latest developments in automatic handling and the international service on full turnkey projects that has made the name SIMON synonymous with bulk handling.



Maple Leaf Mills Ltd.'s Port Colborne (Canada) flour mill: complete bulk storage and outloading facilities for mill products.



Biscuits de Beukelaer at Antwerp: fully automatic bulk flour and sugar storage, handling and distribution system.



Control panels constructed for bread bakeries at Bucharest and Galati, Rumania: entire flour storage, handling and distribution systems by Simon.

The following publications will be useful to everyone with an interest in the latest developments in bulk handling. They are available free.

BULK FLOUR, HANDLING AND TRANSPORT: by G. H. Sugden, Director, Simon Engineering Ltd. A detailed analysis of the economics of bulk handling in flour mills and at users' factories.

PNEUMATIC HANDLING OF BULK FLOUR AND SUGAR: by R. W. Allen, Chief Engineer of Simon Milling Division.

BULK REVIEW: A news-sheet of Simon activities in bulk handling.

UNIBULK CATALOGUE: A comprehensive catalogue of Simon Unibulk package components for bulk handling systems.

SIMON

**BULK
HANDLING
PLANTS**



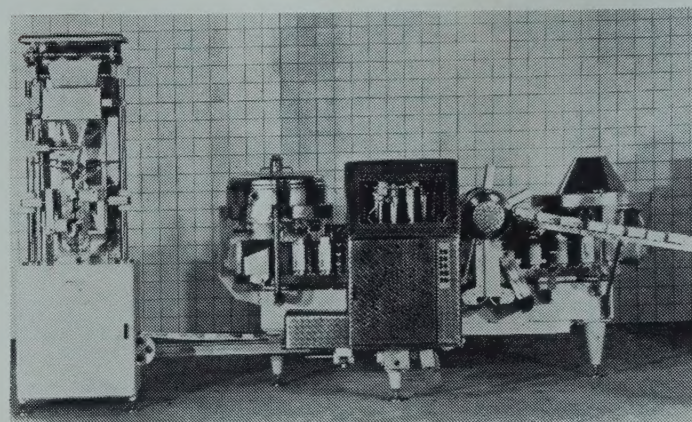
MEMBER COMPANY
SIMON ENGINEERING LTD

Henry Simon Ltd • Food Engineering Dept • Stockport • Cheshire • England SK3 0RT
Tel: Gatley 3621 Telex No: 66-287
London Office, Simon House, 28-29 Dover St., W.1. Tel: Hyde Park 8191.

International Equipment News

Rhin, which has specialized in the manufacture of equipment for the food industries for many years.

This acquisition, together with the company's recent purchase of Etablissements Chelle S.A., leading French manufacturer of bottling equipment, gives Manurhin the most complete range of food processing equipment in Europe. Its products range from apparatus for shops and small enterprises to installation of entire plants, with completely automated equipment.

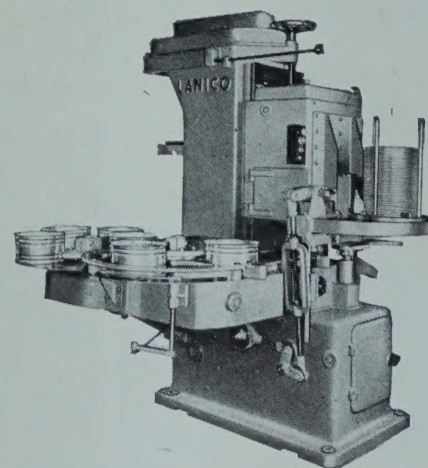


ONE-WAY PACKAGING SYSTEM for milk, fruit juice, red wine in rectangular 1/4, 1/2, 1-liter sizes at speeds to 4,000/hr., features compact design, aluminum/stainless elements for easy cleaning.—Zupack, Darmstadt, West Germany.

Circle 282 on Inquiry Card

LANICO-SEAMERS all over the world...

*Write for
descriptive brochure*

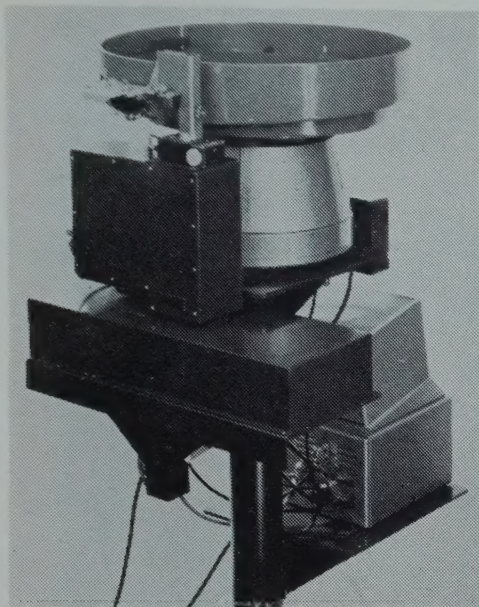


**Lanico-Maschinenbau
Otto Niensch KG**

Abt. II/43

33 BRAUNSCHWEIG/West Germany

Circle 95 on Inquiry Card



Batch Counter Adapts To Any Packaging Line

Designed to operate with any type of automatic packaging line, this machine can produce small counted batches of confectionery items or similar products at up to 60 batches per min.

Called Type 452AD Master-count, machine features optical detection and electronic counting systems. Other features include a high-performance, pneumatically operated switch that divides the flow of counted objects accurately into separate batches, permitting sustained high speed matched to the speed of the packaging line.

The input feed is by means of an 18-in. diam vibratory bowl feeder that can be set up to handle most types of smaller objects easily and quickly.

Unit is capable of handling objects from $\frac{1}{8}$ in. cube to $\frac{3}{4} \times \frac{3}{4} - 1\frac{1}{2}$ in. in size. Batch size, which is preset on the simple control panel, can be from 2 to 144 objects in quantity.—*Decca Radar, Ltd., London, England.*

Circle 283 on Inquiry Card

Alkalinity Control, Permutit Co., Ltd., London Road, Isleworth, Middx., England. Publication explains alkalinity control by the Starvation Process. Describes applications of the process for boiler feed, brewing liquor, potable and process requirements. Also deals with automatic control and regenerating systems. Gives typical analyses of water quality before and after treatment. Features flow diagrams.

Circle 284 on Inquiry Card

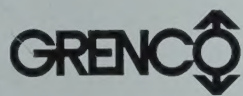
Celanese Colloids in Food, British Celanese, Ltd., 345 Foleshill Road, Coventry, CV6 5AE, Warwicks.,

England. Booklet covers their Celacol and Courlose cellulose derivatives, made specially for the food industry and widely used for thickening, binding, stabilizing, emulsifying and many other functions.

Circle 285 on Inquiry Card

Automatic Screen Printer

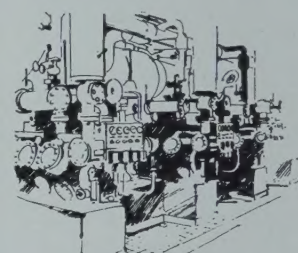
A fully automatic screen printing line for cylindrical, other similarly shaped objects, features air-operated feed and transfer mechanisms actuated by print head from which they get cycle timing. Equipment may be in-



.....hand in glove with refrigeration

This is the symbol of a refrigeration installation company, with extensive international experience to provide the most appropriate solution to your refrigeration problems. A decentralised organisation supplies prompt service facilities, with its own installation research constantly aiming at the construction of improved plants and with experience in the development of complete projects including not only refrigeration plant, but also the entire range of technical equipment. In short - efficiency, experience and service from one source - Grenco.

GRENCO N.V. Head Office: Hertogenbosch - Holland, P.O.B. 304, Telex 50147. Subsidiaries in Brussels, Old Woking (Surrey), Hamburg, Madrid, Vigo, Istanbul, Cape Town, and five in The Netherlands.



Axial-Flow Screw Pumps, Mirrless (Engineers), Ltd., Earl Haig Road, Hillington, Glasgow, Scotland. Publication describes main ranges of TRIRO axial-flow screw pumps and includes technical data, dimensions, performance data with capacities ranging from $\frac{1}{2}$ gpm to 2,400 gpm.



whatever your
starting-out point
for starch may be...

Continental Engineering will design and construct a complete plant for you

For the production of starch from maize, potatoes, manioc, wheat or rice, Continental Engineering, acting as your independent adviser, will design and construct your plant with the maximum efficiency. The activities of Continental Engineering comprise process designing, lay-out of plant and equipment, electro-mechanical installations, piping and civil engineering works. Also the supply, supervision, assembling and putting into operation of the plant involved.



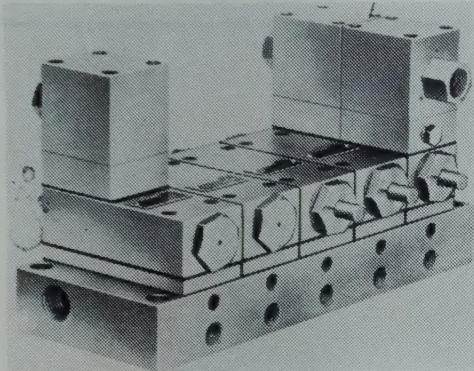
**CONTINENTAL ENGINEERING
AMSTERDAM**

Holland : Amsterdam - Lutmastraat 2 - Phone 71 96 71 - Telex 1 22 05 - Cable : Contenga Amsterdam

International Equipment News

stalled free-standing or with, or without feed table, in any existing feed line.—*Rondec Screen Process Ltd., Egham, Surrey, England.*

Circle 286 on Inquiry Card

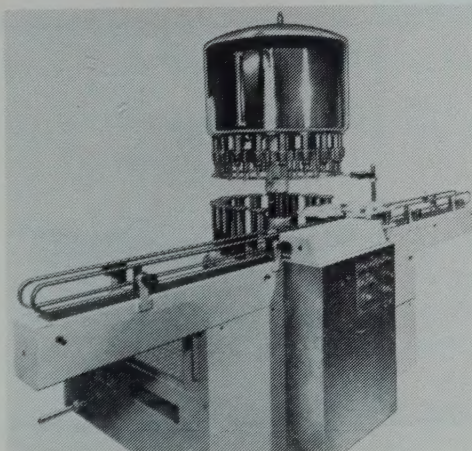


Control Valves—4-Way

A new range of 4-way positive or self-reversing control valves in sizes $\frac{1}{4}$, $\frac{3}{8}$, and $\frac{1}{2}$ -in. B.S.P., made in extruded brass sections with Duralumin spool, Nitrile rubber seats, are suitable for air pressures to 120 psi. Units may be sub-base or simple direct mounted, with manifold assemblies of up to 6 valves of varying types. Can be operated by pilot air or pilot solenoid.—*Midland Pneumatic Ltd., Wednesfield, Wolverhampton, England.*

Circle 287 on Inquiry Card

PACKAGING



Fills Wide Range of Bottle Sizes

A recently developed 18-head rotary gravity vacuum filler for free flowing non-carbonated liquids handles bottles from $5\frac{3}{4}$ - $13\frac{3}{4}$ in. high, up to $4\frac{1}{2}$ -in. dia. at up to 140/min. It will take

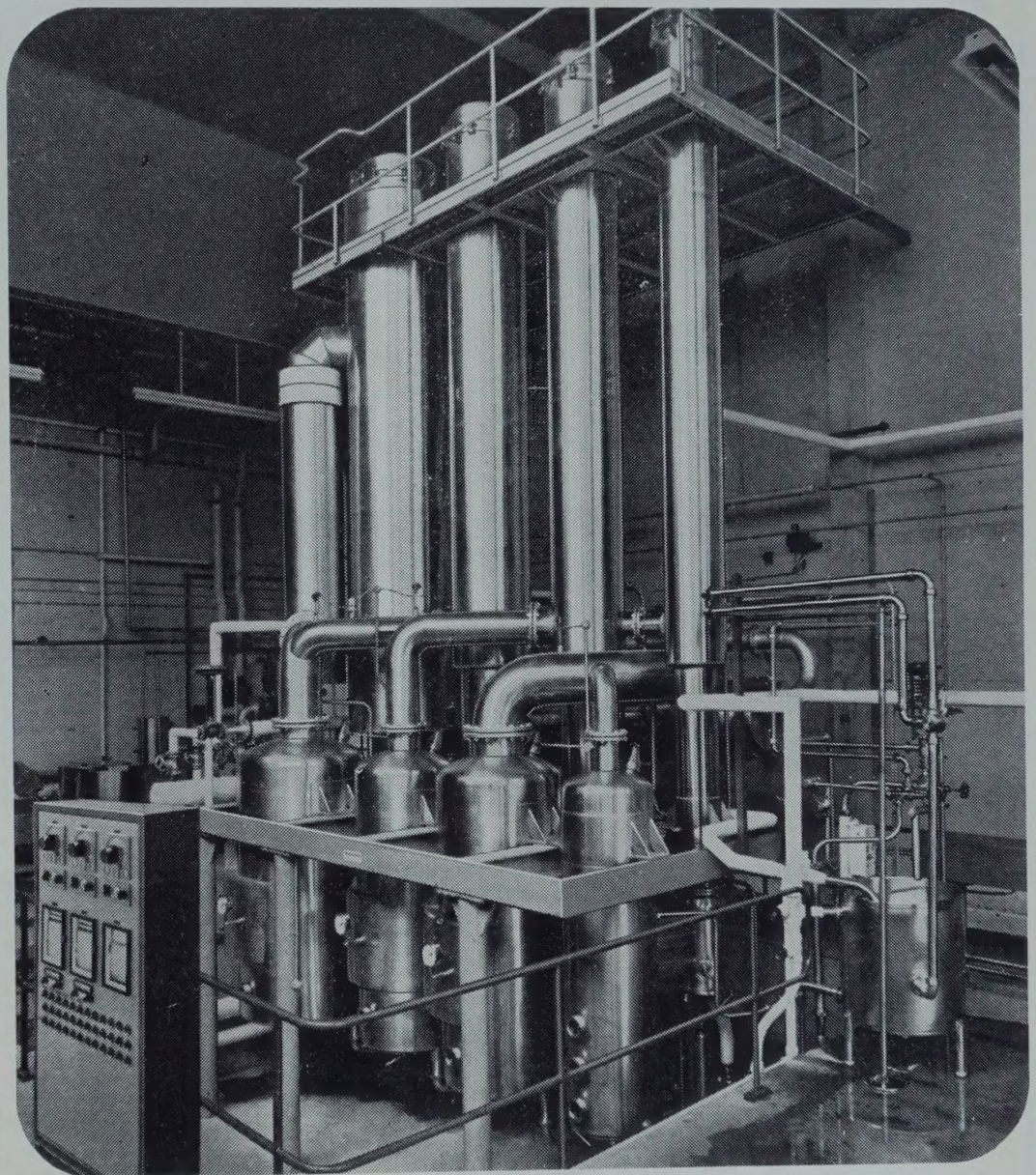
round, square, oval, polygonal or any reasonable shape within the $4\frac{1}{2}$ -in. dia. raising and lowering platform.

A low vacuum is used to ensure against filling bottles with open cracks or chipped necks. Filling valve is designed to avoid drip, give accurate, constant filling levels. All parts directly in contact with product are of stainless steel; product tank holds approximately 55 gal. Machine is

supplied with built-in drive motor, vacuum pump, with or without feed and discharge conveyors.—*Farrow & Jackson Ltd., London, England.*

Circle 288 on Inquiry Card

FE Annual Editorial Index
available upon request
at \$1.00 per copy



Threestage Gravity Flow Evaporating Plant with finisher and control equipment for milk. Capacity: 7800 kg/h (17200 lbs/h) H_2O

We supply:

**Gravity-Flow Evaporators · Aroma
Recovery Plants · Vacuum Cooling Plants**

WIEGAND

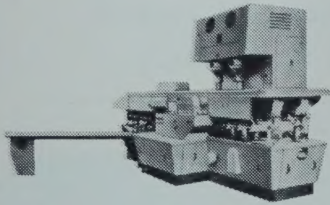
Apparatebau GmbH

75 Karlsruhe 21 · Postfach 211320 · West-Germany

PACKAGING PROBLEMS?

We will solve them with our ultramodern, efficient specialized or multipurpose packaging machines. Our machines handle clothing and underwear, candy, chocolate bars and hollow chocolate, pourable solid materials, zwieback, cookies, almonds, raisins, and many other consumer goods.

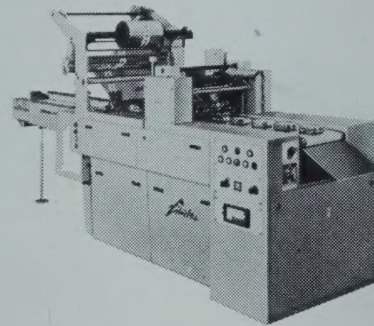
1.



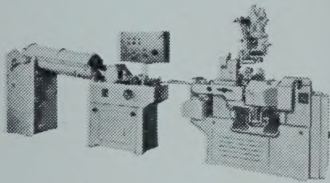
1. Machine AB fills bags with loose materials and seals them, measuring contents either by weight or volume.

2. Packaging machine "Filutex" for clothing and linens, groceries, consumer and industrial goods.

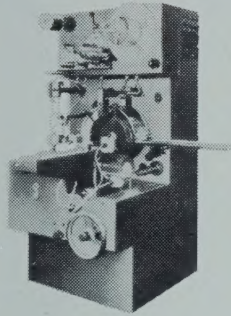
2.



3.



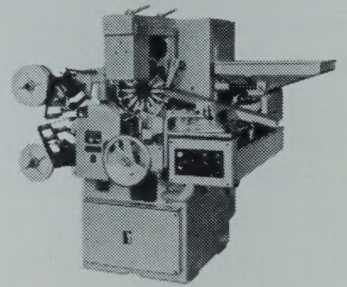
4.



3. Production line "Futurus ET" for caramel candies, including packaging. Rate: up to 600 pieces per minute.

4. Packaging machine ST puts toffees into packs of 5, 6, 8, or 10 pieces per pack.

5.



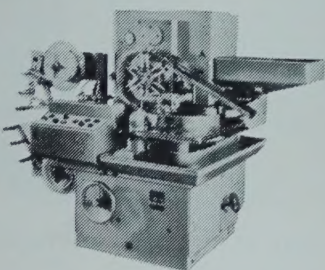
5. Heavy-duty candy-wrapping machine EU 3. Rate: up to 500 pieces per minute.

6. Candy-wrapping machine, EA, with 5 different methods of wrapping. Rate: up to 500 pieces per minute.

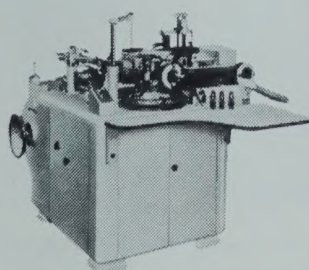
NAGEMA



6.



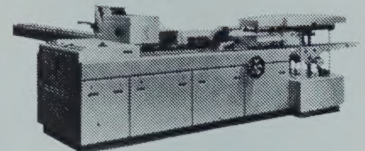
7.



7. Machine HPM for wrapping hollow chocolate. Rate: 30-45 pieces per minute.

8. Packaging machine for baked goods. Type EZ packs zwieback at a rate of up to 50 bags per minute.

8.



EXPORTER:

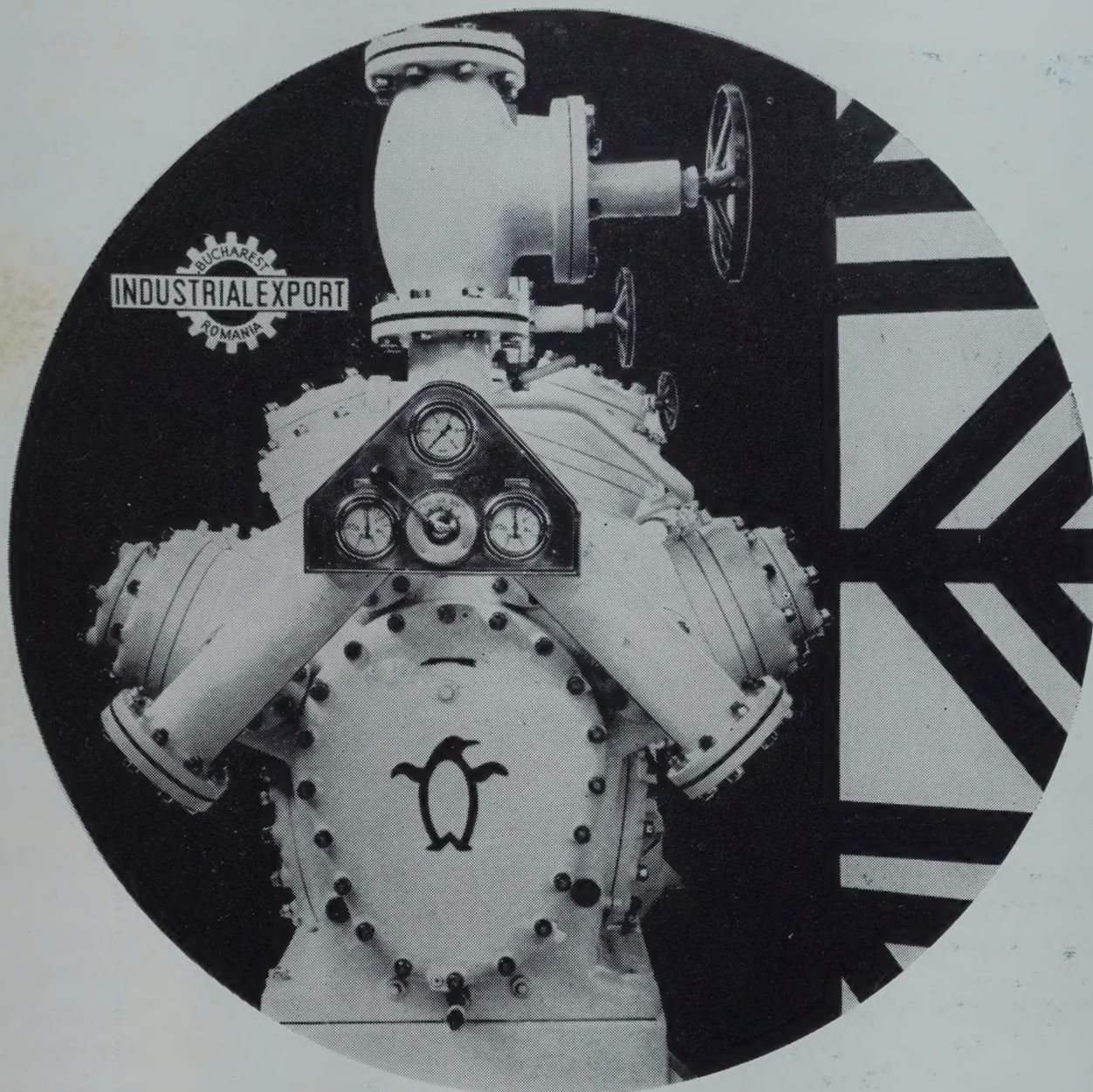


UNITECHNA

Aussenhandels-gesellschaft m.b.h.
DR-108 Berlin, Mohrenstr. 53/54
German Democratic Republic

INDUSTRIALEXPORT

supply:



Refrigerating units and compressors of capacities ranging from 800 to 600,000 kcal/h. covering a large field of applications in the field of freezing and refrigeration.

Ice-making factories for blocks of 12.5 and 25 kg., with capacities from 3 to 100 tons/24 hours.

Special refrigerating store houses for vegetables and fruit with capacities of 1,000, 5,000, 10,000 tons and larger.

Refrigerating storage for the preserving and freezing of food products, including meat, fish, dairy products, fruit, etc., of capacities to buyer's specifications.

For full information apply to

INDUSTRIALEXPORT

Bucharest, Romania

Gabriel Peri St. 2

POB 101

Telex 214

Telephone 116

Cables INEXPORT Bucharest

Why SCHOLTEN'S of all food starches?

Why are so many manufacturers in the whole world using SCHOLTEN food starches? Because Scholten is the largest European manufacturer of starch derivatives and has been supplying food starches for more than 125 years? This may be one reason - but there are more, which have to do with top quality and high reliability. Why should not you invite the advice of our food technicians?

Binding agents, stabilisers and other auxiliaries, i.a. for:

- * soups
- * sauces
- * instant puddings
- * canned foods
- * frozen foods
- * baby foods
- * ice cream
- * confectionery
- * dairy products
- * meats

new auxiliaries for the pharmaceutical industry, such as binders and desintegrators



W.A. SCHOLTEN'S CHEMISCHE FABRIEKEN N.V.
FOXHOL - HOLLAND

Food department - Tel. 05980-1234 - Telegrams Eureka/Foxhol



VOLUME 40

NUMBER 12

DECEMBER 1968

EVERY MONTH

- 9 Trends & Forecasts
- 10 Schedule of Events
- 10 Hors d'Oeuvres
- 13 Developments to Watch
- 17 Washington Report
- 23 Tips to Management
- 27 Packaging Pointers
- 51 Opinion
- 89 Practical Ideas
- 109 Advances In Technology
- 133 Recent Inventions
- 135 Men & Companies

BUYING GUIDES

New equipment, packaging materials, and ingredients will be covered in departments listed below.

If you want more details about certain products, circle on Inquiry Card (at back of issue) numbers corresponding with those at ends of the editorial items mentioning those products.

- 24 New Packages, Products
- 29 New for Packaging
- 43 Ingredients
- 99 Doing It Better
- 114 Equipment & Supplies
- 122 Sanitation & Maintenance
- 124 Just Off the Press
- 140 Books
- 141 Classified Advertising
- 145 Advertisers' Index
- 147 Reader Inquiry Card

- 40 **Packs Pan-Ready Spuds in PVC—Creating the Package**
Ready-to-cook hash browns have eight-week refrigerated shelf life.
- 59 **Rejuvenates 121-Yr-Old Gourmet Food Business**
Wagner expands line, makes packages appealing, keeps quality high.
- 63 **Dries Eggs Profitably**
Gigantic facility dries locally produced eggs at 15,000 cs/week.
- 66 **Gets More Packaging Mileage**
Packs variety of coffees in many different pouch styles and sizes.
- 68 **Can Line Runs at 1,000 Per Min.**
Integrated soft-drink line has automated materials handling units.
- 72 **Makes Single-Servers Gang Style**
Form-fill-sealer makes nine coffee-cream portion-packs at a time.
- 74 **How to Get Most Out of Milk Solids—Part I**
Milk solids are tailored to serve many different functions in foods.
- 78 **Ion Exchange Goes Continuous**
Shows multiple benefits in demineralizing juice, broad application.
- 80 **Keeps It Fresh Longer**
Enzyme treatment provides new baked goods, improves quality of old.
- 82 **Dried Fruits Have Low Microbial Counts**
Study finds low bacteria, yeasts, molds; no Salmonellae, coliforms.
- 84 **New for Processing**
Equipment aids to processors seen at recent meat and brewers shows.
- 90 **Processor and Caterer Team Up**
Serve Armour's frozen prepared entrees to many convention goers.
- 95 **Blends Directly Into Tankers**
In-line digital system brings many benefits to processor, user.
- 101 **Drum-Dries Carrot Puree**
Double-drum unit produces quality carrot flakes in USDA research.
- 102 **Space Sprays More Effective Now**
More lethal against crawling insects and safer for humans, too.

FE NEWS SPOTLIGHT

- 112 Automatically Produces Paper Cans In-Plant
- 121 Reverse Osmosis Makes Brackish Water Potable
- 123 Controls Speed of Salt Feeder Through Conductivity
- 132 Doubles Net-Weight Filling of Free-Flowing Products
- 138 Metal Drums Can Be Assembled in 30 Sec When Needed

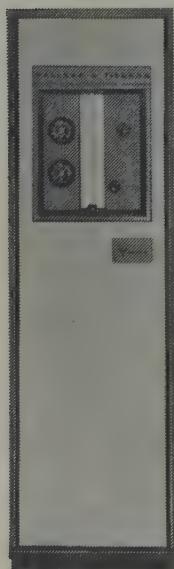


NEXT MONTH

Outlook '69—FE's annual survey of trends in costs, profits, capital expenditures, research; regular monthly features, too.



- *freshens water for re-cycling*
- *purifies can-cooling water*
- *purifies product-ingredient water*
- *retards product spoilage*
- *purifies wash water*
- *destroys slime*
- *lowers bacteria counts*
- *disinfects product carrying water*
- *fortifies clean-up water*
- *disinfects rinsewater*



"DECA-DEXTROUS"

We had to coin a new word to describe the versatility and ten-fold dexterity of W&T V-notch Chlorinators in the food field.

They perform the vital sanitation functions listed above, day in and day out. They're easy to install and maintain, accurate and dependable, long-lasting and easy to operate. They're available in several sizes, each with 20 to 1 feed range. And you can order them with manual control, or with a control unit which automatically adjusts to maintain protective residuals continuously.

W&T V-notch Chlorinators put you ahead in the battle against bacteria. They stretch the life of water, bring higher food profits to you, more quality to your customers.

For further information, please write Dept. S-214.37



WALLACE & TIERNAN INC.

INDUSTRIAL PRODUCTS DIVISION/25 MAIN ST., BELLEVILLE, N. J. 07109

Circle 4 on Inquiry Card

FOOD ENGINEERING

FOR BETTER MANAGEMENT IN MANUFACTURING

GRAHAME E. RIDDELL

Publisher

FRANK K. LAWLER

Editor

ALEX K. PORIANDA

Managing Editor

JOHN V. ZIEMBA

Senior Associate Editor, Chicago

JULIUS BRODY

Associate Editor

KEVIN J. HANNIGAN

Assistant Editor

LEONARD A. CIANI, JR.

Assistant Editor

CAROL A. JAKOB

Assistant Editor

JOHN D. ELLIOTT

Production Editor

J. PHILIP GEDDES

Western Editor, Los Angeles

GEORGE BAKER

Washington Bureau

JOAN E. CARROLL

Editorial Assistant

HOWARD KOHLBRENNER

Art Director

JOHN H. NAIR

Contributing Editor

ARTHUR V. GEMMILL

Contributing Editor

MARTIN S. PETERSON

Contributing Editor

LEONARD TRAUBERMAN

Contributing Editor

ADDRESS ALL MAIL TO: Chestnut & 56th Sts., Philadelphia, Pa. 19139.

EXECUTIVE OFFICE: One Decker Square, Bala Cynwyd, Pa. 19004, Phone 215-748-2000. Business staff is listed in Advertisers' Index.

REGIONAL EDITORIAL OFFICES—Chicago 60606 (120 S. Riverside Plaza), Phone 312-782-1400; **Los Angeles 90015** (1543 W. Olympic Blvd.), Phone 213-287-1271; **Washington, D. C. 20004** (1093 National Press Bldg.), Phone 202-393-3474.

AFFILIATIONS—Food Engineering is a member of Business Publications Audit of Circulation, Inc.; American Business Press, Inc.; Industrial Advertising Research Institute; National Association of Manufacturers; American Management Assn.; Canning Machinery & Supplies Assn.; Dairy & Food Industries Supply Assn. Publisher and principal editors are members of Institute of Food Technologists.

FOOD ENGINEERING® (Formerly Food Industries®) December 1968, Vol. 40, No. 12, published monthly by Chilton Company. Controlled circulation postage paid at Philadelphia, Pa. Title registered in U. S. Patent office © Chilton Company 1968. All rights reserved.

Subscriptions solicited only from individuals in administrative, plant operating, engineering or technical management functions in companies manufacturing foods or beverages. Price for one year to qualified recipients in U. S. and possessions, \$2.00; in Canada and all other foreign, \$10.00; to recipients not in field of FE, \$25. Single copies, \$1.00; foreign, \$2.50.

Food Engineering is indexed in Applied Science and Technology Index and in the Engineering Index.

Volumes microfilmed by University Microfilms.

CHILTON OFFICERS AND DIRECTORS

G. C. Buzby, Chairman of the Board

R. E. McKenna, President

S. Appleby, Financial Vice-President

J. H. Kofron, **L. F. King**, **H. W. Barclay**, Vice-Presidents.

J. Miades, Treasurer. **J. A. Montgomery, Jr.**, Secretary.

Other Directors: **C. W. Hevner**, **T. J. Casper**, **W. A. Barbour**,

R. S. Davidson, **S. H. Collmann**, **R. Rimbach, Jr.**, **R. H. Groves**, **K. R. Brink**, **I. C. Holloway**, Assistant Secretary.

Regional Vice-Presidents: **New York**, **I. E. Hand**; **Chicago**,

J. Bernhardt; **Cleveland**, **W. P. Saunders**; **Los Angeles**, **J. A. Crites**; **Dallas**, **H. E. Mott**.



LINK-BELT®

DIVISION OF FMC CORPORATION

Engineered progress in the creative design, manufacture, and application of mechanical power transmission — materials handling — materials processing



Why Link-Belt **POSITIVE ACTION**® oscillating conveyors provide gentle, uniform flow of fragile products

Exclusive direct-connected Positive Action drive . . . achieves natural frequency rapidly under load. Will not dampen under surge loads. Gentle oscillating motion of corrosion-resistant trough provides constant, uniform material flow without speed adjustments. Complete specifications are contained in Book 2944.

LINK-BELT OSCILLATING CONVEYORS

• **POSITIVE ACTION** identifies only the product of Link-Belt Division, FMC Corporation

Available throughout the world

Link-Belt Division, FMC Corporation, Prudential Plaza, Chicago, Illinois 60601

Inside Alcoa Packaging

Change for the better with Alcoa Aluminum



Alcoa Packaging Development creates the first pilferproof one-piece closure for plastic bottles.

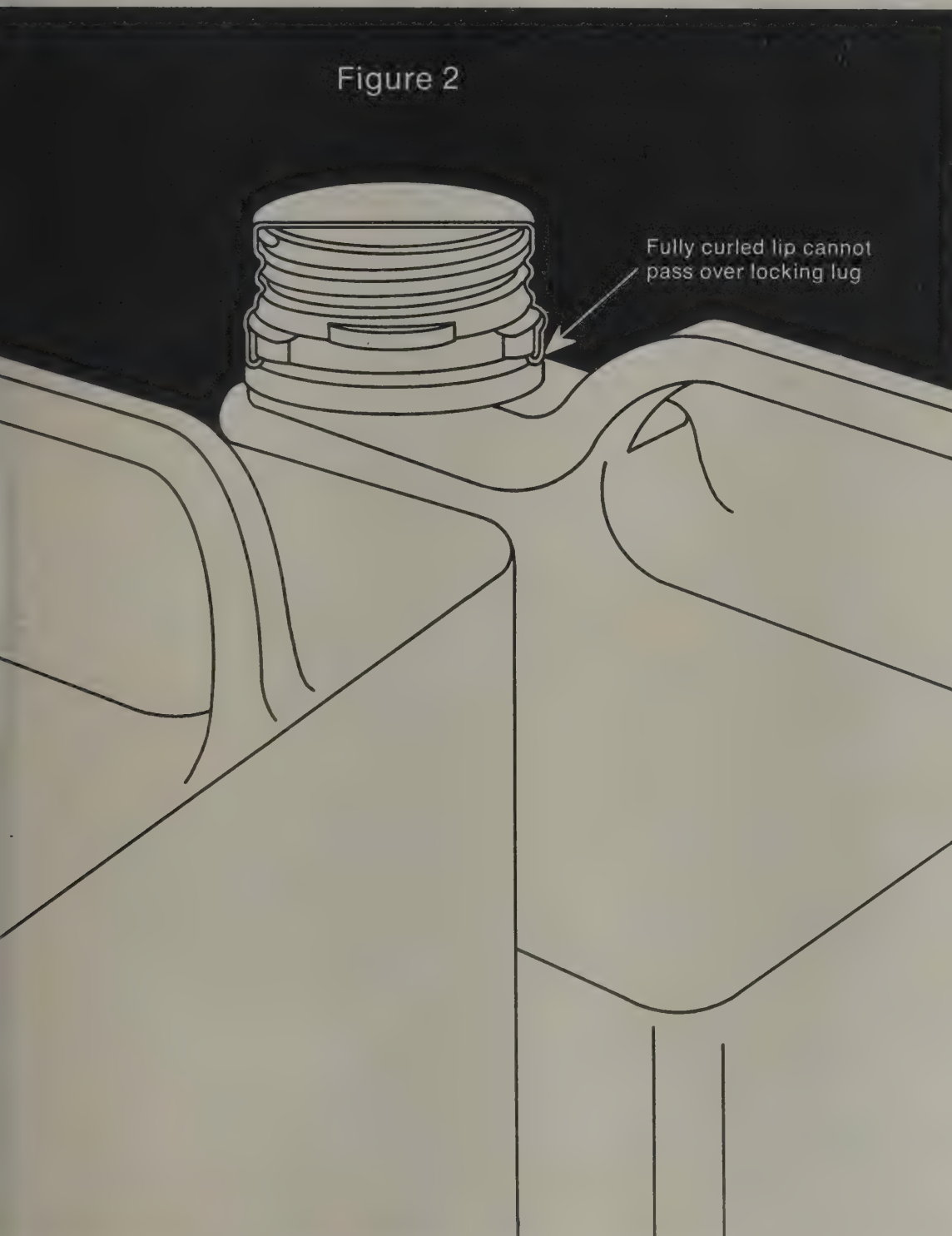
The Alcoa * Plasto-Lok Closure is one of the most significant developments in the long line of Alcoa Packaging innovations. For the first time, a positive-seal closure with a screw cap, pilferproof feature is available for plastic bottles. Until the development of the Plasto-Lok Closure, plastic bottles could not withstand the top pressure required for the application of pilferproof closures. Alcoa has solved that problem. Plasto-Lok Closures are already in use on a variety of products, including antifreeze and milk. The closure is a version of the Alcoa Flavor-Lok® design, now being used widely in the beverage industry. The major differences are the special design of the cap and the bottle finish.

Figure 1 shows the Alcoa Plasto-Lok Closure design. The neck of the plastic bottle has a unique lug system that makes the pilferproof feature possible. There are two sets of lugs, both acting to lock the aluminum cap in place. The cap has an inward curl at the

Figure 1



Figure 2



bottom of the skirt with a break-away score just above it.

Figure 2 shows why the Plasto-Lok Closure is pilferproof. When the cap is put on and turned securely into place, the closure skirt at the base of the cap deflects to an oval condition to slide over the lug systems. After sliding over the lugs, the inward curl returns to a circular configuration and assumes a pilferproof position. When the cap is turned to open the container, the inward curl is caught and held by the lug system. The remainder of the cap breaks away along the scored line, and leaves the aluminum ring on the neck of the bottle. A legend on the cap tells the customer not to accept the bottle if the pilferproof seal is broken.

Pilferproof Plasto-Lok Closures prevent accidental or inadvertent opening of the closure during shipping or handling. The design also allows positive resealing, a requirement for many product packages.

The Plasto-Lok design is applicable to a wide variety of products and container sizes. Go Alcoa, where developments are shaping the future of packaging.

*Trademarks of Aluminum Company of America.



Englewood Cliffs
New Jersey
07632

CORN & NEWS PREVIEWS

DECEMBER

CHOCOLATE & CHOCOLOSE

Special for chocolate manufacturers: CHOCOLOSE® anhydrous dextrose. A new dextrose especially processed for the chocolate industry. It does not mask -- but enhances -- the delicate milk and chocolate flavors of coatings or bars. CHOCOLOSE brings out the true flavors of enrobed centers.

Because of its mild sweetness, confections, biscuits and crackers made with CHOCOLOSE are not satiating; this encourages increased consumption.

The price advantages of CHOCOLOSE over sucrose help to offset the price increase of cocoa beans and cocoa butter -- and there are production advantages as well. Your Corn Products' representative has the details.

GUMS AND Q.E.D.

And while we're speaking of sweets -- let's not forget Q.E.D.™ Confectioner's Starch. This unique product is most superior for making gums and jellies. Its coarser granule size means Q.E.D. goes into solution faster -- and is more uniform as well as less dusty. If you haven't tried Q.E.D. for your gums and jellies ask your Corn Products' representative for a sample.

Circle 7 on Inquiry Card

MOR-REX NO STICK

Rack up another plus for MOR-REX hydrolyzed cereal solids. When added in small amounts to icings, MOR-REX® increases adhesion of the icing to the cake -- and reduces sticking to the carton. Another field-proven reason to talk to your CP representative about this great new ingredient.

Circle 8 on Inquiry Card

New products, ideas and services like these are available in many countries from Corn Products' affiliated companies abroad. See our ad in IFT World Directory and Guide.

COMING EVENTS:

Dec. 5-8	American Hotel & Motel Association, Denver
Dec. 7-11	National Food Brokers Association, N.Y.C.
Jan. 19-22	Food Processing Machinery & Supplies Association, San Francisco*

*Corn Products will be there.

For information on any product or process, for expert technical assistance, write directly to Corn Products or see your local Corn Products' representative.

TRENDS AND FORECASTS



Total U.S. food spending for '68 will be up 6% over '67, according to USDA.

A moderate increase is anticipated for '68 total agricultural output in Western Hemisphere countries, but per capita food production in Latin America is expected to be down significantly from '67's record level.

One-third of NAMA member companies forecast that sales volume will grow by 50% in the next five years. One out of five firms foresees a 100% increase.

World soybean production for '68 is estimated by USDA's Foreign Agricultural Service at 1.42 billion bu. That's up 6% from '67 and 40% above 1960-64 average. U.S. production, at 1.066 billion bu, accounts for 75% of world total.

Sales of soft drinks in returnable bottles declined 4.3% in '67 from '66, says NSDA. Sales of one-ways increased 54%.

Over 99% of American families use some bakery products each week, states John A. Schnittker, Under Secretary of Agriculture. Frequency of use and amount used both increase with income.

Peanut acreage for '68, 1,472,000 acres, is slightly above last year's total, claims USDA.

U.S. production of both evaporated whole milk and non-fat dry milk continued down during September, but condensed milk output continued its upswing.

The use of non-caloric sweeteners in soft drinks in 1970 will about double that of 1965, cites a USDA report.

Cocoa bean grind for the third quarter of '68 amounted to 151 million lbs, notes Commerce Dept. That's a decrease of 1.8% from '67's third quarter grind.

Cattle and calves on feed (for slaughter market) in the 32 major feeding States totaled 9.5 million head on October 1, says Crop Reporting Board. That's up 11% from a year earlier.

Tomatoes for processing in '68 are estimated at 6,750,350 tons. That's 30% above last year's tonnage.

Potatoes used for processing french fries accounted for 34.6 million cwt from '67 crop, notes Crop Reporting Board. Potatoes used for chips and shoestrings totaled 32.3 million cwt.

Unit sales of soft drinks during '67 increased by 31%, according to report issued by the Nat'l Soft Drink Assn.

Production of mushrooms in the year ended June 30, 1968, was 10% above the previous year, reports Ronald B. Hunter, Executive Director, Amer. Mushroom Institute.

SEE
DEVELOPMENTS
TO WATCH
PAGE 13

VERSATILITY:

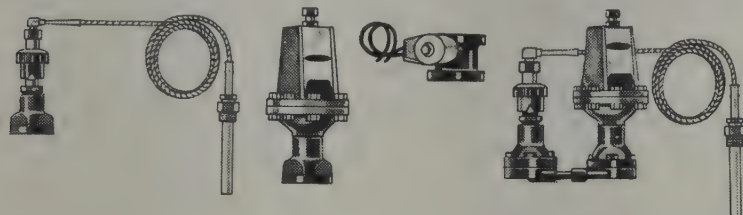
One Sarco "25" Valve Body Does 7 Different Control Jobs All Efficiently

With a "T" pilot you've got a Temperature Regulator, ranges between 0-300°F.

Put a "P" pilot on to make a Pressure Regulator to 250 psi — reduced 3 to 200' psig.

An "E" pilot makes it an on/off remote control electric regulator.

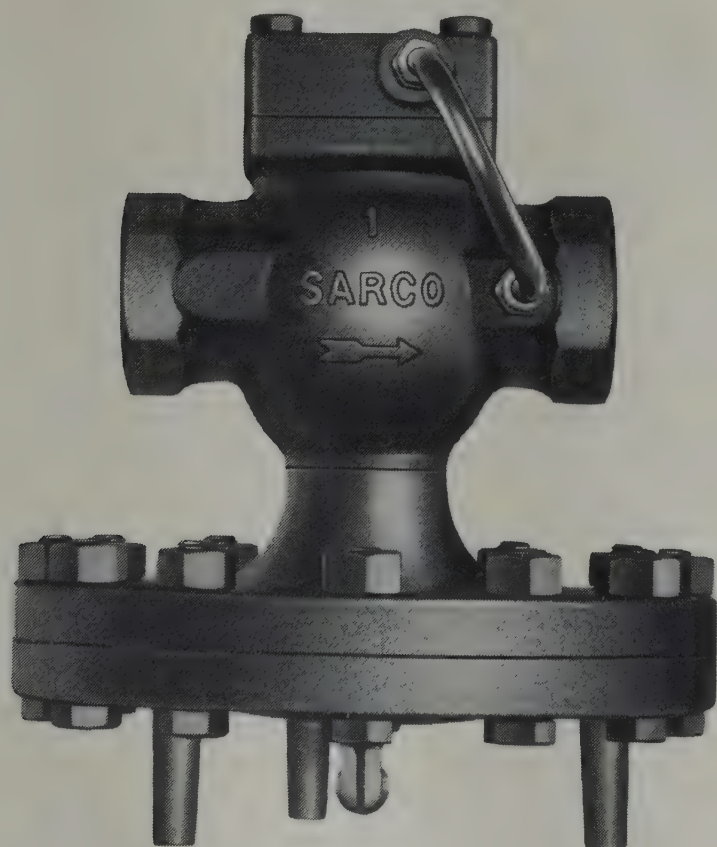
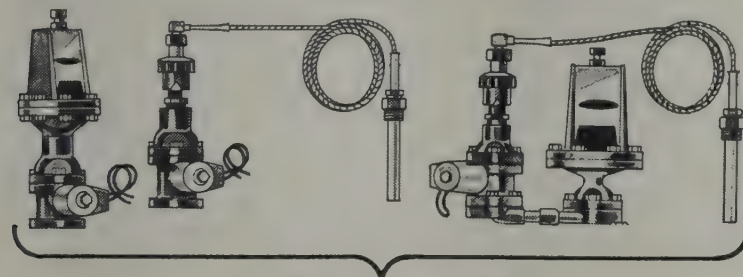
Want a Pressure-Temperature Regulator? Add a "P" and "T" pilot.



"P" and "E" pilots make it into a Pressure Regulator with on/off electric override.

A Temperature Regulator with on/off electric override is yours with "T" and "E" pilots.

And now! . . . use "P" and "T" and "E" pilots and you've produced a Pressure-Temperature Regulator with on/off electric override. Got the idea?



Select the pilot (or pilots) and the "25" Valve is ready to do any one of seven different control jobs — efficiently and economically. Sizes from 1/2" to 4". For free handy selector guide giving full details on control capabilities write today.

Sarco Company, Inc., 1951 26th Street S.W., Allentown, Pa., 18105.



Schedule of Events

DECEMBER

- 2-6—Food Processors Short Course, Oregon State Univ., Corvallis.
- 3-4—Food and Drug Law Institute and the FDA, joint educational conference, annual, Marriott Twin Bridges Motor Hotel, Arlington, Va.
- 9-12—USA Standards Institute, annual, Sheraton Park Hotel, Washington, D. C.
- 10-12—Amer. Soc. of Agricultural Engineers, winter meeting & Agricultural Engineering Show, Sherman House, Chicago.

JANUARY

- 19-22—Nat'l Canners Assn., annual, San Francisco, Calif.
- 19-22—Food Processing Machinery & Supplies Assn, Nat'l Exposition for Food Processors, Civic Center—Brooks Hall & Arena, San Francisco, Calif.
- 20—Vinegar Institute, Western meeting, Mark Hopkins Hotel, San Francisco, Calif.
- 20-22—Dairy Conference, Univ. of Georgia, Athens.
- 27-30—ASHRAE, semi-annual, Conrad Hilton Hotel, Chicago.
- 27-30—Internat'l Heating & Air-Conditioning Exposition, Internat'l Amphitheatre, Chicago.
- 27-31—Nat'l Dairy Council, annual, Statler Hilton Hotel, Cleveland, Ohio.
- 29-Feb. 1—Nat'l Macaroni Mfrs. Assn., winter meeting, The Diplomat, Hollywood, Fla.
- 30—Ice Cream Conference, Univ. of Maryland, College Park.

FEBRUARY

- 3-Jun. 20—Course on Baking Science and Technology, Amer. Institute of Baking, Chicago.
- 9-12—Food and Drug Law Institute, Food Update Seminar, Sheraton-Boston Hotel, Boston, Mass.
- 10-12—United Fresh Fruit & Vegetable Assn., annual, Roosevelt Hotel, New Orleans, La.
- 11-13—Dairy Industry Conference, The Ohio State Univ., Columbus.
- 12—Symposium on Nutrition and Food Technology, Lake Shore Club, Chicago.
- 12-14—Short Course on Applied Quality Control for the Food Industry, Conrad Hilton Hotel, Chicago.
- 13-16—Institute of Amer. Poultry Industries, Fact Finding Conference, Municipal Auditorium, Kansas City, Mo.
- 19-23—Nat'l Institute of Oilseed Products, annual, Erawan Garden Hotel, Palm Desert, Calif.
- 25-26—Nat'l Dairy Engineering Conference, Kellogg Center for Continuing Education, Michigan State Univ., East Lansing.
- 26-Mar. 1—Nat'l Independent Meat Packers Assn., mid-year conference, The Americana of Bal Harbour, Bal Harbour, Fla.

HORS D'OEUVRES

► It took nine years to come up with the peanut butter standards and 5,000 words to detail them. Such facts sort of stick to the roof of a taxpayer's mouth.

► Borden's one and only Liederkranz cheese, now celebrating its diamond jubilee, was developed by an apprentice cheese maker for a Manhattan delicatessen owner. And it was taste-tested in Liederkranz Hall by the famed singing society. Ah, the romance of R & D!

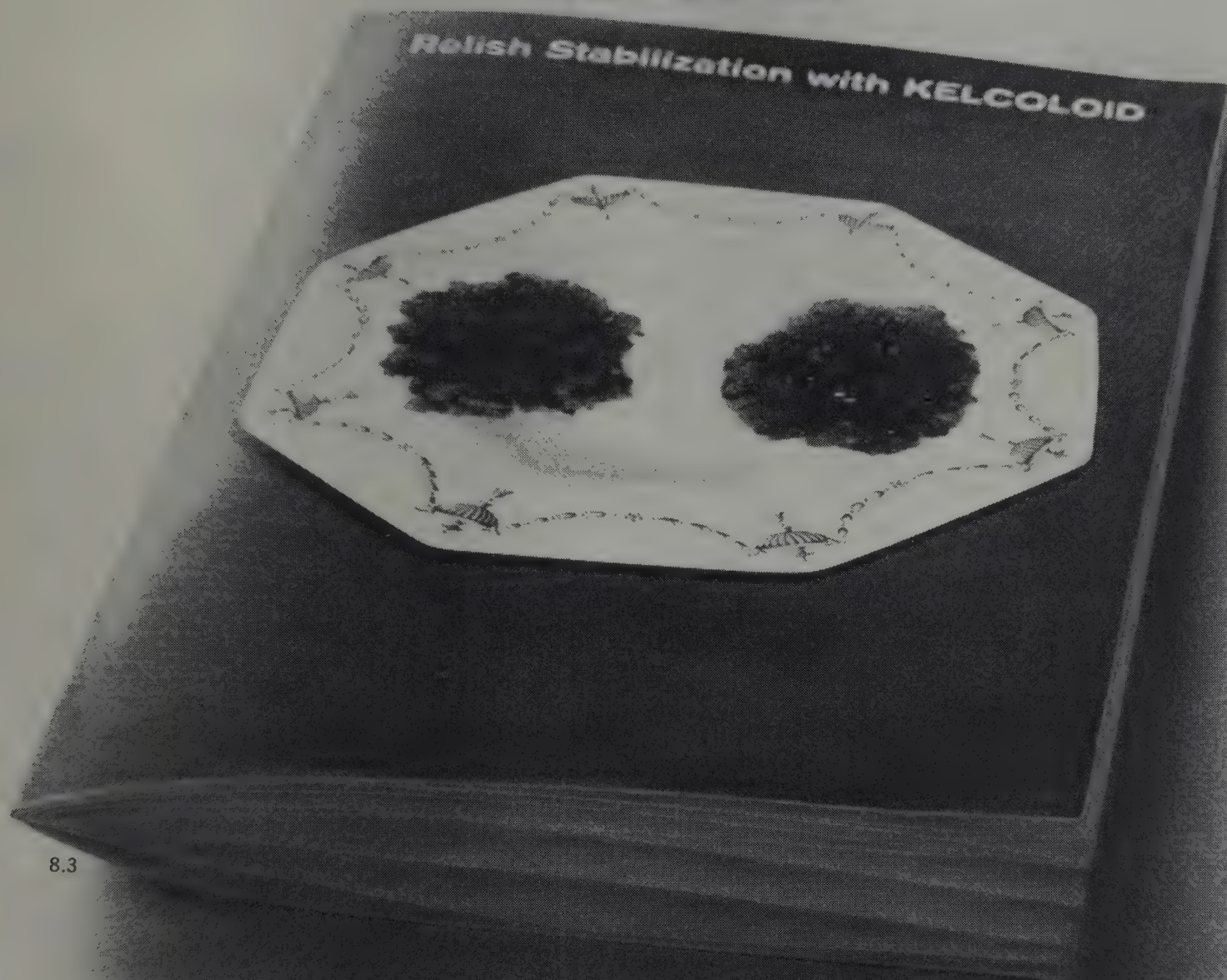
► Kelly-Springfield applies a thin film of milk to the hot rolls of rubber processing mills. It makes the rubber adhere just the right amount to the proper roll. Now you know what can be done with milk as it is replaced by vegetable product substitutes.

► Two decades ago, the cost of bakery product distribution amounted to 18% of the wholesale price. Today the cost is 35 to 40%. Progress has gone a bit stale.

► Packaging experts believe that a friendly informative meeting can establish rapport between industry and consumer representatives. 'Tis doubtful. Do-gooders are offended by facts.

What we know about relish stabilization could fill a book.

This book.



8.3

Whether you're picking a peck of pickle or pepper relish, onion, tomato, mustard or corn, this book will interest you. Included are lots of details on both the production and marketing benefits of relishes stabilized with KELCOLOID.[®] You'll see how KELCOLOID* improves production handling, enhances overall quality and can help build greater profits.

If you'll tell us your name and address, we'll tell you everything we know about relish stabilization with KELCOLOID.

*Propylene Glycol Alginate

Kelco

- ☐ I'd like a copy of your 16 page booklet on relish stabilization.
☐ Please have one of your technical representatives contact me.

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Werner engineers have created equipment that will automatically produce chocolate covered brownies.

It was one of their nuttiest assignments.

Normally, you'd envy a firm who's producing 80% of the commercial brownies consumed in the United States. But when profits get eaten as fast as the product, it's not what you'd call a bed of roses. The reason? Hand labor. Like 80 people on the production line. Plus, the recurrence of overweights and a non-uniform product.



So what happened? Werner's engineers designed and built a special automatic brownie processing system. That eliminated 64 workers. That turned out a completely uniform product. That increased total production by 25%.

Because of this tremendous increase in productivity and profits, the customer has promised to give us a shot at his other five plants. How's that for scoring a few brownie points?



WERNER

WERNER MACHINERY COMPANY ■ 3200 FRUIT RIDGE AVENUE, N.W. ■ GRAND RAPIDS, MICHIGAN 49504 U.S.A.
PHONE: (616) 453-5451 TELEX: 022-6428 CABLE: WERNERMACH

DEVELOPMENTS TO WATCH



Beverage bottles will be filled at rate of 2,000/min with new 48-wide, straight-line, gang-fill machine developed as project of Glass Container Mfrs. Inst. Unit will have 48 6-valve assemblies and will include rinser, charger, filler, sealer, and warmer. It will be made in 1,000- and 500-bpm capacities also.

New continuous liquid egg freezer produces 5-lb slab with indentations indicating 1-lb units for convenient use. FMC Corp. developed it from frozen stick-confection machine by using larger freezing molds between carrier chains. Slab is easy to break up and thaw.

In new European process, potato chips are fried conventionally to moisture content of 10% and until desired color is reached (oil temperature, 280-300F). Then chips are finished in vacuum fryer at 200-212F to reduce effect of oxygen on quality.

Microwave moisture analyzer is said to be working well on cream cheese, salad dressings, and margarine. It is analyzing cream cheese on-stream and might effect automatic continuous control.

Activated carbon will purify waste water from bottle washing and cleanup, as well as steep water from malting. It follows preliminary waste treatment to reduce load on carbon.

Rotary vacuum filter is being used to remove fine suspended solids from plant waste. There is trend toward applying process separating equipment to waste treatment, including vacuum filter, centrifuge, aerating mixer, and granulated carbon.

Reverse osmosis takes more than 90% of load off laboratory water-purifying system. It reduces algae and other organic materials to 2-5 ppm.

New automated warehouse system involves pallet-load storage racks and automatic carrier that runs on floor rails. Operation is directed by dialing or by punched cards. Interlake developed it.

Electronic weighing platforms in capacities of 10 to 20,000 lb operate on strain-gage principle. Weighing is said to be easy, precise, and accurate over a long period. BLH Electronics makes them.

Aerodynamic dust collector is rated 100% efficient for particles as small as 5 microns, and 94% at 2 microns. Vane imparts rotary motion to upward vertical flow. This throws particles outward where they are picked up by gas streams directed downward.

New \$3.5 million, 97,000-sq ft center for food research and education has been dedicated at North Carolina State U. It includes pilot plant.

Graduate teaching and research program in food science has been established within Institute of Nutrition Sciences at Columbia U. Courses include food chemistry, technology, analysis, production, regulations, and safety evaluation.

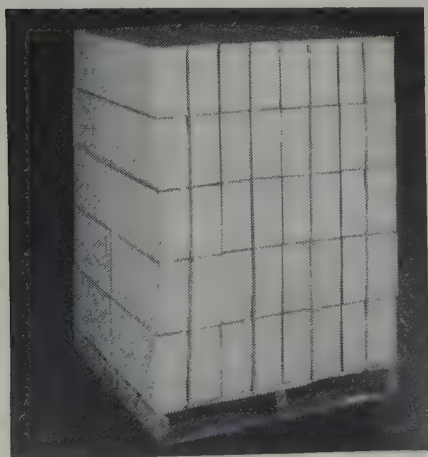
SEE
WASHINGTON
REPORT
PAGE 17



Don't get caught with your straps down.

Switch to Avistrap polypropylene strapping.

Eliminate the trouble and expense of re-strapping before shipment. Palletize with Avistrap polypropylene strapping. You'll virtually do away with slack and loose strap problems. Because, unlike steel strapping, Avistrap contracts slightly as a load settles or is compressed by other loads on top. So Avistrap stays tight where steel does not. Avistrap also has twice the impact resistance of steel—but not the biting edge. It won't cut forklift tires. It can't stain or rust. And it's safer, lighter, easier to use. Best of all, Avistrap saves 10 to 30% over steel strapping costs. Write for our folder on palletizing and unitizing with Avistrap.



AVISTRAP

RAYON CORD AND
POLYPROPYLENE
STRAPPING

American Viscose Division, Industrial Packaging Dept.
1617 John F. Kennedy Blvd., Philadelphia, Penna. 19103



LIFE PRESERVER

Klenzade's Aseptic Techniques
for best flavor and shelf life

Klenzade's Mikroklenz DF sanitizer and Mikro-Master work together to preserve the natural goodness of food and dairy products. They prevent contamination after pasteurization or high temperature processing—all through the critical processing area.

Exclusive MIKRO-MASTER precisely controls the sanitizer used as a final rinse additive in container rinsing and as a germicidal spray during filling and closure operations. It is the only metering and dispensing equipment that controls injection of liquid iodophor sanitizer into a water line on a volumetric basis.

Flow-activated Mikro-Master needs no outside source of power. Installs anywhere in the water line. Two models—BW for central sanitizing system, CPS for spot spray sanitizing. Both give the same pinpoint control of sanitizing operation. Installation is supervised by Klenzade

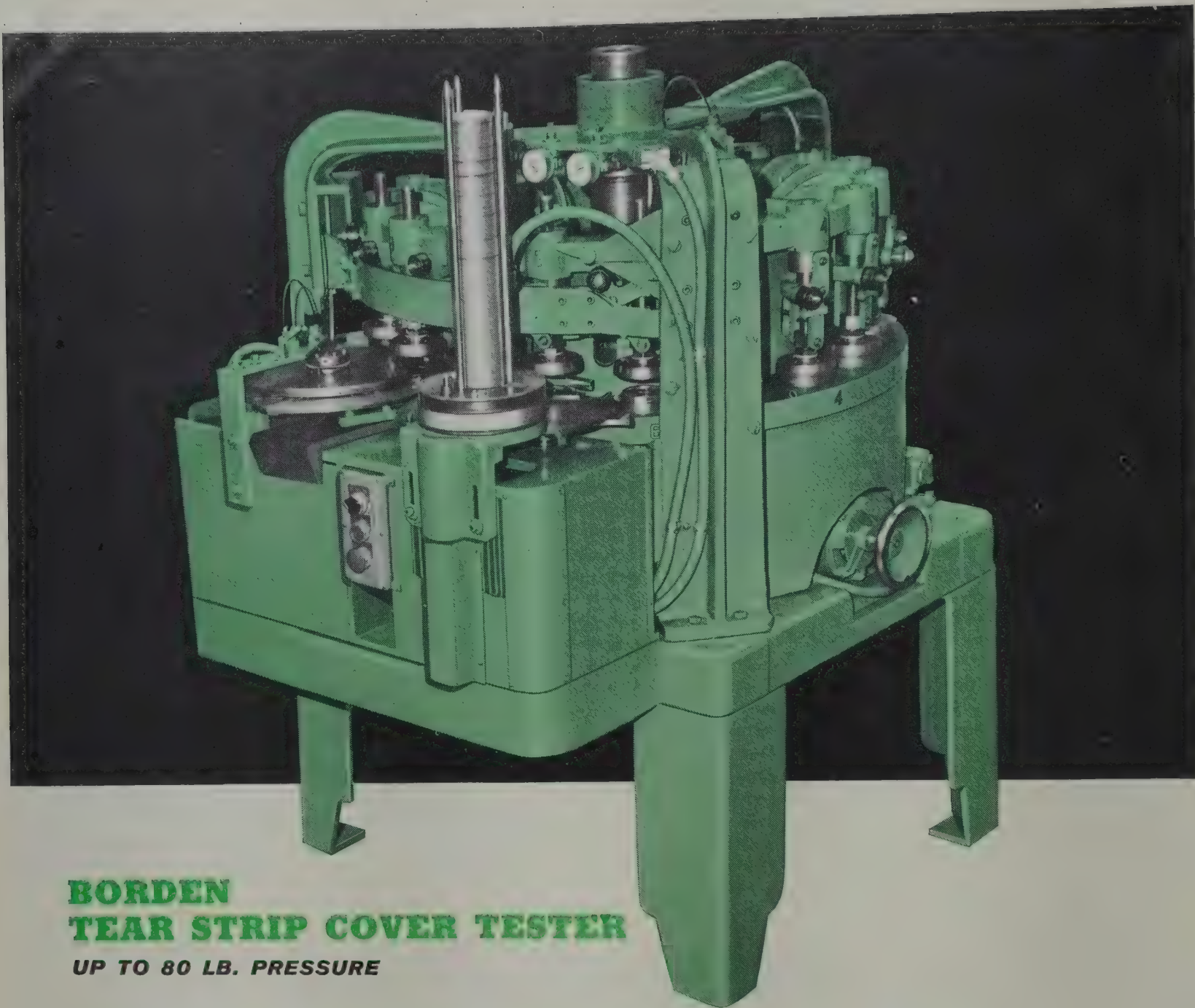
and the unit will be kept in perfect condition at no extra cost to you.

MIKROKLENE DF is an ideal iodophor sanitizer for use with the Mikro-Master. It is a powerful, fast-acting liquid germicide detergent—highly effective against bacteria, molds, yeasts, and viruses. Goes directly into solution without mixing. And it complies with FDA regulations for use without a final rinse.

Put Klenzade Aseptic Techniques to work in your plant. Combined with Klenzade Single Organization Responsibility, they're a real life preserver for product flavor and shelf life. Contact your Klenzade Technical Representative or the home office. For completeness, quality, and cost control, it's KLENZADE PRODUCTS, Division of Economics Laboratory, Inc., Dept. 2381, Osborn Bldg., St. Paul, Minn. 55102.



Why processors spell clean with a "K"

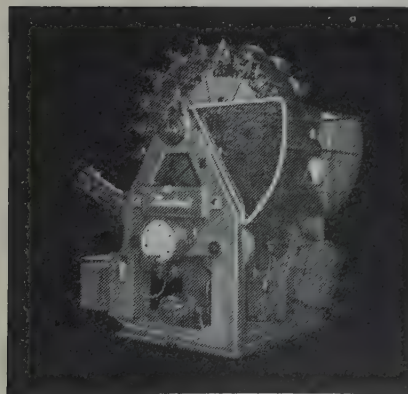


BORDEN TEAR STRIP COVER TESTER

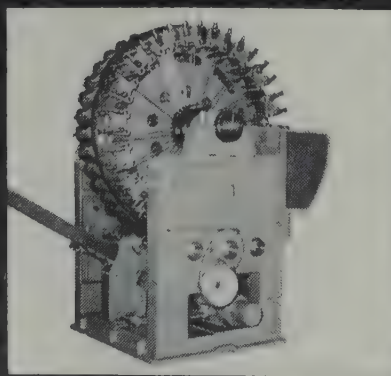
UP TO 80 LB. PRESSURE

The 180B-80 Cover Tester is the latest model of the Borden Tester line. It has been designed and developed as a HIGH PRESSURE TESTER to test the new tear strip, or easy opening can end, as well as conventional can ends. Any test pressure up to 80# can be used, detecting and automatically rejecting ends

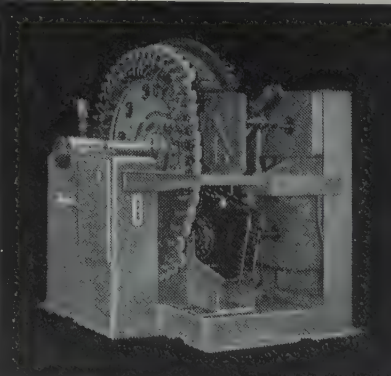
that leak as little as 2 cubic centimeters with 10# of air pressure in 10 seconds under a water test. It is designed to test ends as small as 202 diameter or as large as 404 diameter at speeds up to 300 per minute. A larger machine for diameters over 404 is now available. Each different size end requires its own set of tooling.



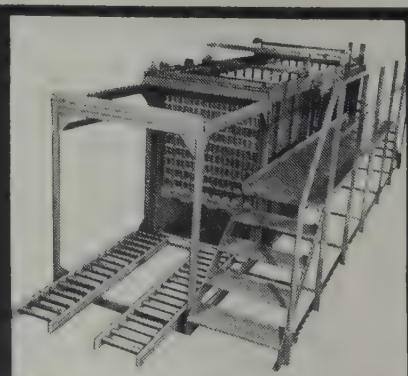
**18 POCKET
CAN TESTER**



**36 POCKET
CAN TESTER**



**48 POCKET
CAN TESTER**



PALLETIZER

THE CAN MACHINERY DIVISION OF THE
BORDEN FOODS COMPANY
Randolph, New York • Telephone: 358-6451

WASHINGTON REPORT



Computer Data on Poultry

The Federal Trade Commission is ready to allow the employment of data processing equipment to gather and give out information on the actual production and sales of poultry products. Individual identity of participants will remain secret to others except in long-and-short emergencies. When a processor finds too few chickens to fill contractual obligations, he will be able to get information through the computer on getting more chickens.

The service is to be made available solely to poultry processors on a daily basis; poultry distributors are not interested in participating. Other subscribers may receive weekly or monthly information summaries but not daily reports. So far, the program is only in the planning stages.

Inflation Followed by Recession?

Cost of living is expected to head onward and upward. Pierre Rinfret, of Rinfret-Boston, a leading economic consultant, believes two more years of inflation are ahead for this country. Mr. Rinfret, who as an expert for Lionel Edie Co., predicted the last recession and when it would turn around, adds that solving the cost-of-living problem will be most difficult. Adding to the problem is the increase of state and local debt. Taken collectively, the debt boosts the national deficit even further. Meanwhile, President Johnson prepares the first \$200 billion budget in this country's history. His administration also saw our first \$100 billion budget.

Foods for Vending—Need More

Over 3 million persons now buy at least one meal a day from vending machines, the U.S. Dept. of Commerce reports. Total food market by 1980 could easily be in the \$20-\$25 billion range. With the number of students increasing, by 1980 one billion meals will be served during the normal school year of 180 days.

Labor costs in personal selling activities have been sharply increasing in recent years, making machine selling an ever more attractive alternative. Vending machines are used to augment or totally replace the cafeteria in many modern in-

dustrial plants. Also, the trend toward impulse buying by persons with rising disposable incomes will continue to help expand the vending market.

See No Food-Policy Changes

President-elect Nixon's food and farm policies will not stray far from established crop-control and support-payment policies. Specifics of the new administration's policies will be made known soon. Inside word is that there will be no radical departures from the status quo. The rationale: Farmers, food processors, consumers all now rely heavily on the existing basic pattern of crop controls and support prices. The job at hand, so the logic runs, is to improve upon the basic framework, not start any revolutions.

Look for Higher Trucking Rates

Truck transportation is likely to be more expensive in 1969. Teamster union contracts with the truckers are keyed to the cost-of-living. With inflation continuing in 1968, Teamsters will get more in their 1969 paychecks. Trucking companies will have to ask for higher rates—probably in the 3%-5% range. When it takes longer for a truck to travel, the driver is paid more for delivering the goods. What makes matters worse is that inflation is likely to continue through the next year or two.

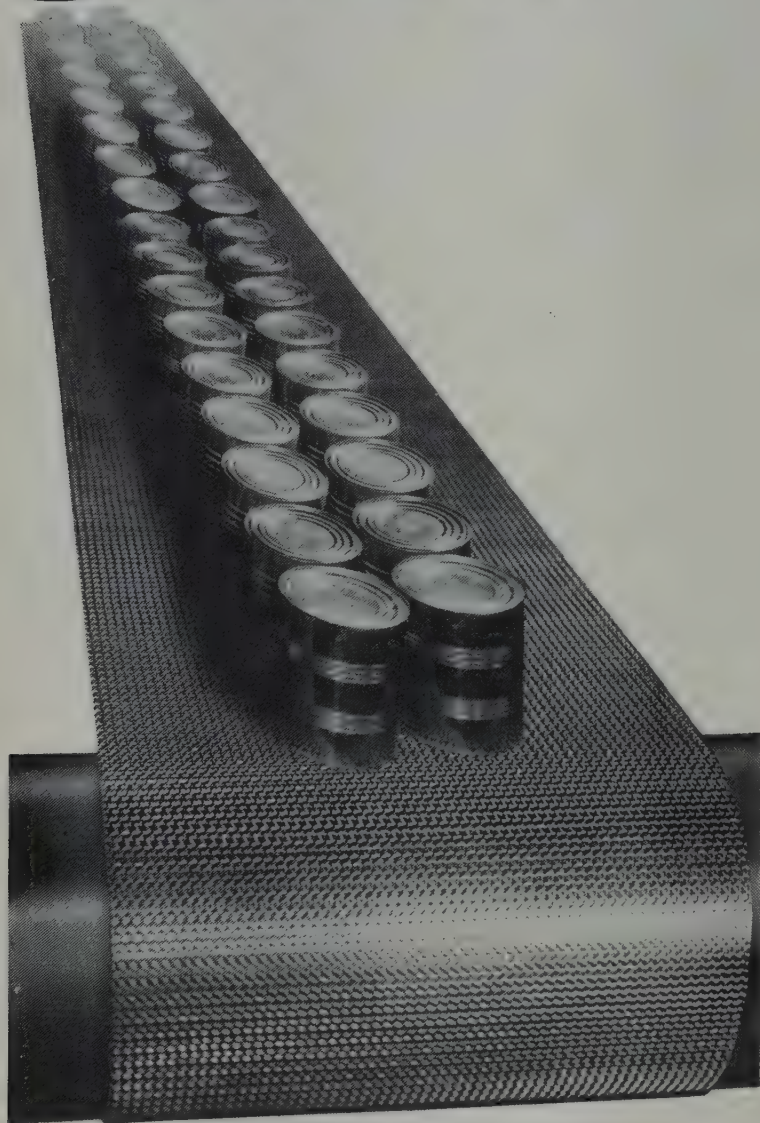
Probe Deeper Into Fats

USDA is taking another look at fats and cholesterol. There's a growing suspicion here that polyunsaturated fats are not the unqualified superior of animal fats, as was once supposed. USDA has asked the University of Nebraska to make specific study of the effect of increased amounts of polyunsaturated fats on reproduction, of physical development of the young, of intelligence, and of the aging process. So far, other government agencies, including the National Heart Institute—mindful of advocating a cholesterol count in earlier days—are cautious about what new course, if any, they will take.

Quantity Standards Next Year

With the new year, standard quantities will be packaged for breakfast cereals, coffee, paper

Give downtime a good belt.



The belt shown is a balanced spiral.

You whip process-handling downtime problems with Tyler belts because they are made to order to do just that for *your* job specifically.

Tyler service engineers analyze your processing operation and help specify the right belt for your service conditions. The right weave—the right alloy—the right design—the right width—the right length.

Then Tyler precision manufacturing delivers your belt with unequalled speed—made to your requirements—to give you top performance.

Call the nearby Tyler engineer. He will help you without obligation. Or write The W. S. Tyler Company, Division of W. S. Tyler, Inc., Tyler Boulevard, Mentor, Ohio 44060. Offices in principal cities.

The Tyler belt line is endless.

W. S. TYLER

WIRE CLOTH • SCREENING MACHINERY • SIEVES • WIRE PROCESSING BELTS

Washington Report

towels, and salad and cooking oils. Breakfast cereals will have 16 distinct sizes, instead of 33, and range at every ounce from 4 oz through 16 oz, plus 20-oz and 22-oz packages. Coffee will come in eight different sizes instead of 10, the even-numbered ounces from 2 through 16.

Paper towels will come in eight different varieties instead of 30 and range from 85 sq ft to 200 sq ft. The seven varieties of cooking and salad oil sizes will be 12 oz, 16 oz, 24 oz, 32 oz, 38 oz, 48 oz, and 128 oz—seven different sizes instead of 15. Other food items for which commitments have been made to standardize sizes are: jellies and preserves, mayonnaise and salad dressings, peanut butter, and pickles.

Urge More Open Bidding

The new Congress may well insist upon more open bidding on military contracts. At present, only 11.5% (value) of government contracts are let to successful bidders. Competitive negotiation accounts for 30.6%, and single-source negotiation 57.9%. The military establishment argues that the increase in negotiated (i.e., no bidding) contracts is due to the sophisticated and complex nature of the equipment demanded by the Army, Navy, and Air Force. But, asks the U.S. General Accounting Office, by what stretch of the imagination are common light bulbs and common food items rated as "sophisticated and complex?" GAO and a growing number of congressmen would like to see a rise in the value of contracts for civilian-type items let by competitive bid.

BRIEFS

Older employees legally have the right to employment, the U.S. Labor Dept. says. They can't be barred from promotions nor discharged because of age. Nor may their pay be lower or their hours and other conditions of work be less favorable than those of other employees.

In spite of mechanization, the number of hired farm workers is rising again, after five years of shrinkage. Just over 3 million, the farm workers comprise 75% male, 75% white, and more than 50% are housewives, students, or otherwise part time.

Negro ownership of business firms is accelerating. This year, Washington underwrote about \$100 million in bank loans to Negroes opening new stores, new factories, new places of business.

Canada's discriminatory moves against imports of U.S. corn will be offset in part by immediate tar-



Corn Industrial presents the City by the Bay in a portrait by Arthur d'Arazien. Our current advertising for Mor-Rex® hydrolyzed cereal solids salutes 'Man and His Plans,' counterpointing the role of the food planner as an Architect of Tomorrow...In harmony then, this great San Francisco and the National Exposition for Food Processors.

corn INDUSTRIAL

DIVISION OF CORN PRODUCTS COMPANY/ENGLEWOOD CLIFFS NJ 07632

Washington Report

iff cuts on other U.S. farm products—fresh pork, preserved meat products, lard, lard compounds, animal feeds, clover seed.

FTC's proposed rules for advertising allowances still simmering and are tentatively slated for publication early in 1969.

Bread with double today's protein values is within reach, USDA says. Goal: successful blending of wheat flour with flour from soybeans, cottonseed, peanuts, or safflower—to make such a loaf palatable and at low cost.

Overseas meat suppliers are planning voluntary cuts in their shipments to the U.S., rather than risk the alternative of mandatory U.S. curbs on meat imports.

Weed-killing chemicals are now used on 6 out of every 10 U.S. acres in cultivation, USDA reports—especially heavy in acres allotted to rice, peanuts, potatoes.

The U.S. Tariff Commission is investigating the importing of olives and wants to find out the

conditions of competition in the U.S. between olives bottled or canned in the U.S. for retail sale.

Food-short India is buying \$169 million worth of U.S. commodities: 2.3 million tons of wheat and wheat flour, 90,000 tons of tallow.

STANDARDS & REGULATIONS Amended

Bread. Amendment alters definition and standard of identity for bread to permit use of ethoxylated mono- and diglycerides as an optional ingredient. Effective 60 days after publication.—Fed. Reg., October 23, 1968.

Food Additive. Regulation provides for safe use of calcium stearoyl-2-lactylate as a conditioning agent in dehydrated potatoes.—Fed. Reg., October 23, 1968 (effective date).

Eggs, Egg Products. Amendment alters identity standard for dried egg yolks, dried yolks to prescribe minimum amount of egg solids that may be contained in the food irrespective of whether anti-caking agent is used. Effective 60 days after publication.—Fed. Reg., October 31, 1968.

Despite the fact that the X-25 continuous cooker-extruder is an industry-proven unit, one of its major functions is experimentation with new products. This fantastically flexible continuous cooker-extruder is designed for lab, research and development or full scale operations...and the X-25 thrives on ideas. On the X-25 you can change the die, cook varied starch, meal, flour, or mash formulas with high or low moisture content.

TOMORROW'S TOOL TODAY

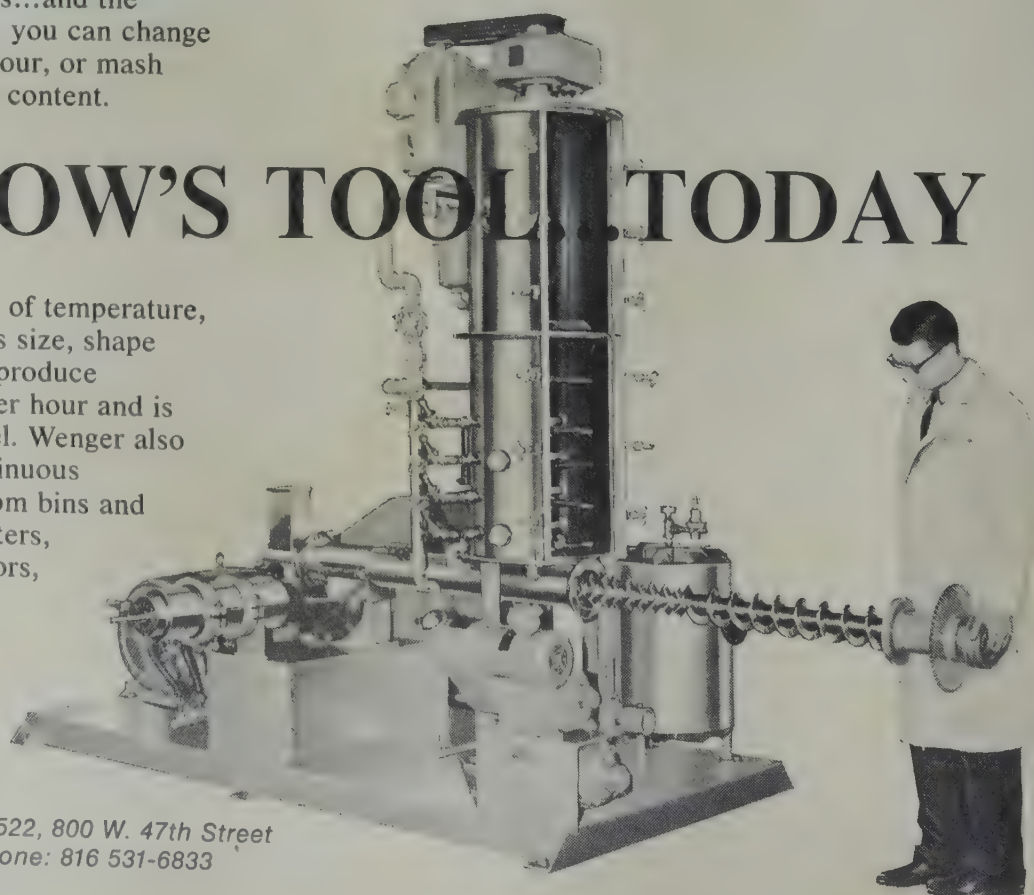
The X-25 permits precision control of temperature, water, steam and texture, as well as size, shape and color variation. The X-25 will produce capacities of 300 to 1500 pounds per hour and is available in stainless or carbon steel. Wenger also manufactures a range of other continuous cooker-extruders, custom live bottom bins and feeders, continuous driers and toasters, and continuous applicators for flavors, cheeses and seasonings. For full information, call or write:



Industrial Division

Wenger Mixer Mfg.

John Hancock Bldg., Suite 522, 800 W. 47th Street
Kansas City, Mo. 64112 / Phone: 816 531-6833



What's Jamison doing at Caesars Palace?



Not everything at Caesars Palace in Las Vegas is a gamble. True, if you wish to wager a small sum on the roll of the dice or the turn of a wheel, the management will be happy to oblige you.

But management absolutely insists that when you enter one of the

elegant dining rooms at the Palace, there be no gambling whatsoever on the food.

An important element in maintaining high food standards is the standard applied to refrigeration. That's why Jamison is at Caesars Palace. With 17 stainless steel food service doors

—cooler doors and freezer doors.

Everywhere today—in hotels, motels, restaurants, cafeterias and other food service establishments—the leading cold storage door specification is Jamison. There's a good reason. Jamison takes the gamble out of specifying doors.

For complete details write to Jamison Door Company, Hagerstown, Maryland 21740.

COLD STORAGE DOORS BY
JAMISON
JAMISON DOOR COMPANY • HAGERSTOWN, MD.

Will water, corrosion, oil, dirt, abrasion or impact knock out Joy electrical connectors?

Negative.

If your goal is to cut production downtime to an absolute minimum, you have a friend in the reliable line of Joy electrical connectors. They shrug off harsh environments, assuring you circuit integrity. Their one-piece, molded, neoprene design makes Joy connectors jerk-resistant and distortion-proof; light, trim and safe to handle; absolutely watertight from cable junction to connecting face; long-lasting and trouble-free. Complete descriptions, as well as applications, electrical parameters and designs are described in our new illustrated bulletin B-93. Just write Joy Manufacturing Company, Electrical Products, New Philadelphia, Ohio 44663.



TIPS TO MANAGEMENT



Another Way to Greater Profit

Developing new growing areas for existing plants is a good way to improve profitability according to Libby's annual report for '68. An inherent problem in vegetable processing is the need to process large quantities of product in short periods of time. Since pumpkin is packed in only about two months in the fall, expanding the packing season by a mere few days can mean a big gain. The same plant can process more tons, and earlier shipments are possible in the concentrated selling season.

During the past year, Libby developed new growing areas for pumpkin farther south in Illinois. That permitted pumpkin harvest to begin three weeks earlier, with the produce trucked to Libby's Morton, Ill., plant. That in turn improved total product cost by lengthening the plant's processing season, and it placed Libby's in a better sales position to meet retailer's early season demand.

Suggests New Post in Companies

Chairman of Committee for Economic Development, William C. Stolk, urges corporations to appoint an "Executive Vice President for Public Business." Such a position would be filled by a qualified senior executive who should be able to manage the corporation's public business just as systematically as its private business. Mr. Stolk maintains that "every company must be involved in improving its social environment—for its own best interest, the welfare of the community and the country. We do not yet have a clear corporate rationale and strategy for this task."

Mr. Stolk proposes that the cost of a corporation's social responsibilities be considered just as much a part of the true cost of doing business as any other costs—raw material, sales, maintenance. He believes that a company's public business be considered a line and not a staff function, and that it be placed on the same level as manufacturing and marketing.

NLRB Abuses Power Repeatedly

NAM Reports, an organ of Nat'l Assoc. of Manufacturers, cites practices of the Nat'l Labor

Relations Board that have consistently violated the Taft-Hartley law. NLRB actions have practically guaranteed freedom of speech under the T-H law to unions but almost never to employers. Even a slight hint of benefits by an employer brings prompt denunciation, while extravagant promises by unions are ruled justified.

Further, according to NAM Reports, employers have been ruled in violation of the law for not permitting unions to use company premises and working time to propagandize their employees. In representation cases, the NLRB has set aside elections which unions have lost, even though the employer had not used material that threatened or made promises of benefits. And although the law prohibits secondary boycotts, the NLRB has repeatedly made decisions that emasculate provisions of this law. Our economy, therefore the public in general, has suffered.

Your Next Problem: Guarantees

Faygo Beverages, Inc., Detroit, has concluded a pact with the Teamsters union that will have broad implications in the industry. Contract provides job security and income guarantees related to changing soft-drink distribution practices. Faygo driver-salesmen with 90-day seniority status get job assurance throughout life of the agreement, and those with three or more years of seniority are guaranteed minimum annual gross earnings of \$10,000.

Faygo's adoption of a dual distribution program in Detroit was very instrumental in contract negotiations. Responding to requests from Detroit's supermarket managements, the company decided to allow the chains to pick up its beverages for distribution to stores. Most of Faygo's Detroit sales will still be delivered by the company's own trucks. However, driver-salesmen were concerned that the new plant pick-up program would jeopardize their jobs. Needless to say, Faygo is now studying the effect of the higher labor costs on its wholesale pricing.

Dun & Bradstreet is setting up a computerized data bank that will be the world's largest single source of essential marketing information on almost all U. S. commercial establishments.



BUSHY-TAILED BAGS

BUSHY-TAILED BAGS BOOST COOKIE SALES

Taylor Biscuit Co., Raleigh, N.C., is packaging its cookies in colorful polyethylene bags. New packages consist of an inner tray of vacuum formed polystyrene plastic and an outer polyethylene bag with a plas-tie closure. Plastic trays have three separate compartments for product protection during shipping and handling.

Each cookie variety is color coded with its own bright stripes. Coconut cookies are packed in



NEW PACKAGES AND



NEWFANGLED POTATO CHIPS



TWO-WAY STACKING

pink and white striped bags; oatmeal cookies in yellow and white; and chocolate chip cookies in blue and white.

Outstanding feature of newly designed bags is their flared "bushy tails." These provide convenient carrying handles and facilitate reclosing packages after some of the cookies have been removed.

Package Products Co., Inc. designs and produces polyethylene bags. (251) Malanco Plastics, Inc. supplies plastic trays. (252)

NEWFANGLED POTATO CHIPS

Pringle's Newfangled Potato Chips are being tested by Procter & Gamble, Cincinnati, Ohio. Products, packed in compact stacks, are said to be of uniform shape.

Company has reportedly perfected a completely different process for making potato chips. Potatoes are dehydrated and made into a smooth consistency. Then chips are formed in uniform shapes by specially designed machines and fried in about 15 sec.



COPOLYMER FILM HAS HIGH SEAL STRENGTH

Sau-Sea Foods, Inc., Yonkers, N.Y., is using bags made of ethylene copolymer film (Union Carbide Corp.) for its frozen cooked shrimp. Three-mil film reportedly has excellent impact resistance and high seal strength at low temperatures. Toughness of the bags is about twice that of bags made from the same thickness as conventional polyethylene film. Transparent bags are printed with three-color design. (253)



COPOLYMER FILM

PRODUCTS

NEW ENERGY DRINK

Half-Time Punch Mix, a lemon-lime energy drink, has been added by Bike Athletics Products Div., Kendall Co., Chicago.

When dissolved in ice-cold water, product replaces body fluids, salts and sugars lost through sweating. It reportedly provides sodium chloride, sucrose and D-glucose, vitamin C (25% of adult minimum daily requirement per 8-oz serving), calcium carbonate, potassium chloride, and magnesium carbonate.

Mix, a concentrated powder, is packed in foil envelopes. Each 12-oz packet makes one gallon of drink. Suggested price for a case of twelve packets is \$12.60.

NEW PACKAGES PERMIT TWO-WAY STACKING

John R. Thompson Co., Chicago, is packaging its Holloway House frozen foods in new packages featuring individually designed front and back panels. Varnish-coated cartons can be stored either vertically or horizontally in freezers. Full-color

NEW ENERGY DRINK



For more data, circle item numbers on card at back of issue.

LOOKING AHEAD



ANNOUNCES NEW HARVESTER WITH HYDROSTATIC DRIVE

Also available
with Automatic
Scow Level Control
and
Brush Outside
Pickups at slight
additional cost



OTHER CRCO HARVESTERS

Chisholm-Ryder Hi-Boy
Snap and Lima Bean
Harvester.

Chisholm-Ryder Self-
Propelled Pea and
Lima Bean Combine.

Chisholm-Ryder Grape
Harvester.



- Maintains maximum efficiency on picking reels, conveyors, elevator and cleaner fan regardless of ground speed.
- Ground speed instantly adaptable to field conditions.
- No gear shifting.
- Self-contained oil reservoir in tractor proper eliminates need of oil reservoir in front of tractor.

Write, Wire or Phone TODAY for Complete Information



CHISHOLM-RYDER CO. INC.

MACHINERY for HARVESTING and PROCESSING FOODS

NIAGARA FALLS, NEW YORK 14305

New Packages & Products

product photographs appear on both front and back of packages. New design also includes easy-open push-tab on side of carton.

Aluminum heating-serving trays are another packaging innovation for frozen meat dishes. Formerly, items came in foil-lined cartons and heating was done right in the box.

Newly designed cartons are produced by American Can Co. (254). Ekco Products, Inc. supplies aluminum trays. (255)



CHEESELEAVES, new, paper-thin wafers, are being imported from England by the Cresca Co., Inc. Product needs no refrigeration, comes in six flavors: celery, barbecue, garlic, caraway, parmesan, and chive.

BRIEFS

Old World Pecan Fudge Brownies have been added by Keebler Co.'s Food Service Div.

Jeno's, Inc. has four new varieties of Pizza Rolls: Ham and Cheese, Chiliburger, Cheeseburger, and Chicken.

Frozen Very Thin Sirloin Steaks are Colonial Beef Co.'s latest addition to its retail line.

Ac'cent-International's new Village Inn Rice packages (FE November, p. 26) were designed by Blau/Bishop Associates, Chicago.

PACKAGING POINTERS

They Make Some Beer, Too

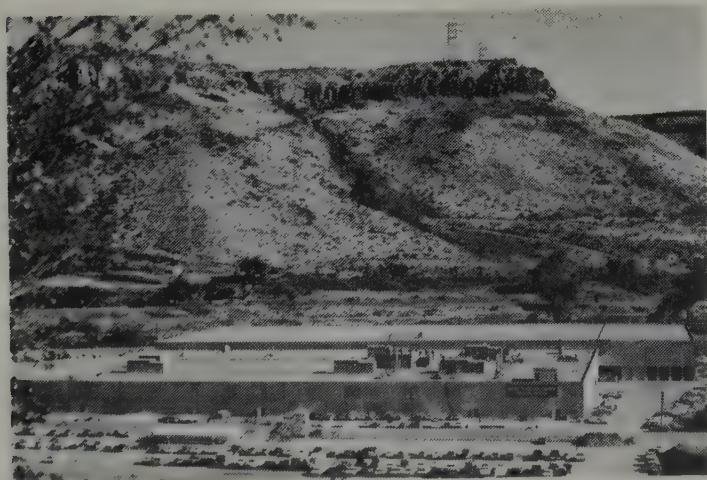
For a brewery that didn't want to be in the can business, Adolph Coors Company has come a long way. By 1971, all the firm's canned beer will be in aluminum containers made by Coors' own container plant east of Golden, Colo. At full capacity, the new plant will produce about one billion cans a year.

Coors also has an improved method of moving cans to the mile-away brewery. Besides using pallets, the brewer has developed the "cell-bin" transporter—a 130,000-can truck trailer equipped with 10 bins. The bins are split by nine vertical dividers, each a can length apart. Cans are "poured" into the cells in each bin until full. At the brewery, the whole trailer is tipped on its side to "pour" the cans out.

The Pick of the Litter

Aluminum packaging has been accused of causing special problems in established waste disposal programs. A particular claim is that aluminum does not degrade readily in sanitary landfills. But now The Aluminum Association takes issue with such criticism.

"No material buried more than three to five feet deep will degrade readily," the group says. "There normally is not enough oxygen at that level." The metal also has scrap value which might keep it out of trash cans in the first place



ONE OF THE LARGEST aluminum can-making facilities in the world is the Coors Porcelain Company Container Division at Golden, Colo. Plant's current capacity of 600 million cans per year will be boosted to a billion cans annually by 1970.

if a national reclamation program can be started. In the meantime, the Association says, aluminum's lighter weight is an advantage in transporting refuse to the landfill site.

PE-Coated Packaging Gains

Use of polyethylene for extrusion coating reached 318 million lb in 1967, up 4% from 1966, according to Du Pont's 10th Annual Market Survey. About 70% of the total was for food packaging.

PE-coated paperboard increased more than 5 million lb in 1967, to a total of 181 million lb, led by milk carton stock (85% of total), frozen food cartons and bacon board. Coated foil combinations gained almost 35%, with major increases listed for military uses and dry mixes. Coated or laminated transparent films declined 12.5% due to more PVC being used for fresh meat packaging, and more adhesive-laminated or coextruded structures being used for processed meats and cheese.

Outlook Good for Paperboard

Despite the rapid growth of plastics packaging, total paper and board consumption has not been cut. In fact, according to a recent study by Predicasts, Inc., plastics may very well increase paper consumption, except for some individual paper grades.

While plastics' greatest inroads are against containerboard, total containerboard production will grow faster than the general economy, aided by new markets won with plastic-coated boards. Milk carton stock is expected to decline about 23% by 1980, but production for frozen food packaging will rise sharply. And a rapidly growing market will boost cup and container stock production about 15% by 1980.

Prints Four Labels at Once

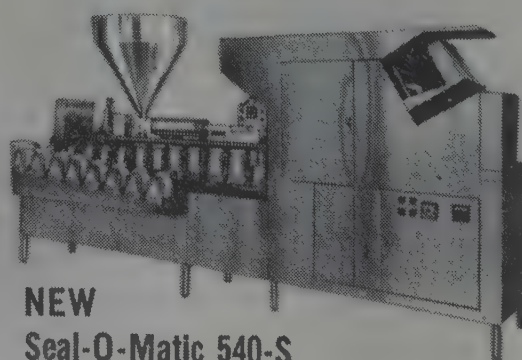
Ever Ready Label Corp., Belleville, N. J., has adapted the carbonless-paper concept to pressure-sensitive labels. Using specially treated paper, up to four copies of a label are made with one printing. Then labels are peeled off and stuck on package. First use is for shipping labels, but future applications could include food packages.



One good thing leads to another PACKAGED FOR LESS

Over 500 different products are perfectly packageable in plastic-coated paper cartons by Haskon's automatic form-and-fill equipment—at big savings. Unit package cost can be lowered by three or four times. Labor costs can be cut up to 50% (even more) with one-man operation.

Newest Haskon packaging machine is the Seal-O-Matic 540-S, a fully automatic former-filler that sets up, fills, and seals 12 one-gal. or 18 half-gal. cartons per minute. (Plastic-coated, foil-laminated paper carton speeds: 10 one-gal. or 16 half-gal.) Takes less than 15 minutes to switch sizes. Like all other Haskon units, the 540-S is custom-engineered for the products to be packaged. Your product—Liquid? Viscous? Granular? At least 20 possible sizes of cartons can be handled on Haskon units—better, faster, for less. Learn how Haskon's form-fill-seal system can cut your packaging costs. Write or call Haskon, Inc.* 2285 University Ave., St. Paul, Minn. 55114.



NEW
Seal-O-Matic 540-S

*A wholly owned subsidiary of **HERCULES**

HASKON
INC.
EQUIPMENT DIVISION

NEW FOR PACKAGING

Milk Cases You Can Throw Away

A recently introduced one-trip, disposable milk case could end the problems of handling wood, plastic and metal cases. The one-trip case, which handles nine 1/2-gal or four 1-gal containers, consists of three elements: a corrugated paperboard pad on which the milk cartons are placed, a vertical corrugated sleeve that provides horizontal and vertical strength, and an over-all wrapper of strong, wet-strength paper.

Called the Rap-A-Way Packaging System, cases are produced by special machinery at 1,000/hr. System cases milk on-line, receiving Pure-Pak cartons by conveyor into the proper number of units, placing them on the corrugated pad, encasing the unit in the sleeve, and wrapping the unit in wet-strength paper. System discharges cases ready for shipping

Circle 338 on Inquiry Card



at the rate of 17/min, fast enough to handle the output of two Ex-Cell-O T-P 1/2-gal machines.

The disposable case simplifies the job of stocking store dairy cases. Rap-A-Way carton is simply ripped open and discarded.—*International Paper Co., New York City.*

Circle 339 on Inquiry Card

produced by a horizontal production method employing two molds operating "hand-over-hand" to provide greater output.—*GTL Plastics, Plainview, L.I., N.Y.*

Size for Food Papers

A new fluorochemical paper size has been introduced for use in direct contact with foods. A recent amendment of FDA regulation 121.2526 allows use of the new size (Scotchban FC-807) for direct contact with aqueous and fatty foods where the food is not heated in the container.

The new size combines cost savings and superior performance for folding cartons, flexible packaging and special food grade

board. It can be used as a surface size, a beater additive, or as a coating additive. And the new FDA amendment permits its use for hot-filled or pasteurized packaging even up to 150F.—*3M Company, St. Paul, Minn.*

Circle 340 on Inquiry Card

Film for Cakes, Snacks

A new polypropylene copolymer film is for packaging bakery and snack foods. Called Olefane TD-70, it has improved impact strength and toughness, may also be used for hard candy. Film is available in 1- and 2-mil thicknesses, possesses outstanding machineability, printability, heat-seal strength and clarity.—*Avi-sun Corp., Philadelphia.*

Circle 341 on Inquiry Card

Disposable Dispenser

A new disposable product dispenser called "Tak-A-Pat" is being used in restaurants, hotels and institutions to dispense butter pats. Unit can be used also for jellies, condiments, syrups, etc., in single-service units.

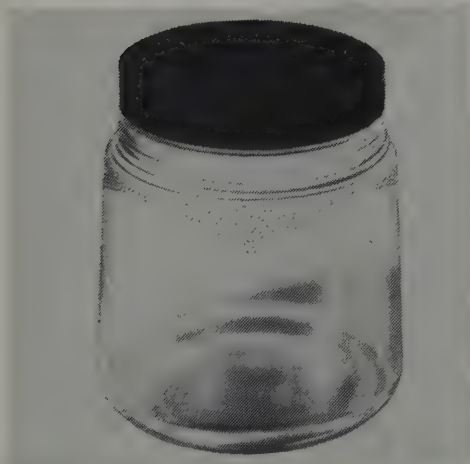
The corrugated fibreboard unit measures about 1-ft square by 4 1/4-in. deep and holds six 1-lb boxboard butter trays. A perforated dispensing area provides access to the six double stacks, three on each side. A separate taped tube is used to protect printable dispenser during shipment.—*Stone Container Corp., Chicago.*

Circle 342 on Inquiry Card

GLASS CAN BE METALLIZED

... by a simplified decorating process that lowers costs. Involves spraying, overcoating, and curing at low temperature.—*Owens-Illinois, Toledo, Ohio.*

Circle 343 on Inquiry Card



Wide-Necked PVC Bottles

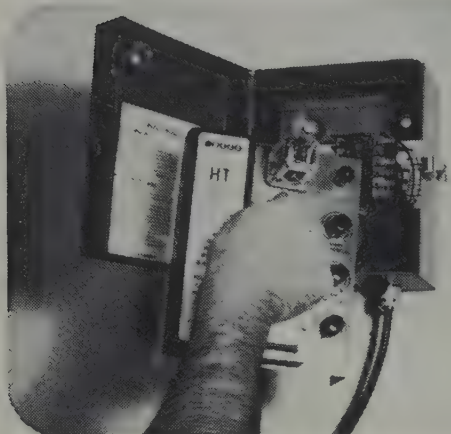
A new 1-pt, wide-necked, rigid PVC bottle having exceptional clarity is suggested for food use. The bottles can also be blow-molded in sizes from 4-oz up to 30-oz, using FDA-sanctioned compounds. The containers are

For more data, circle item numbers on card at back of issue.

ASK PECO!

If we don't have a stock answer... we'll help find one!

PECO... the Number One Specialist in conveyor line controls



Solve one problem at a time



...or many!

PECO Controls (proximity and photo eye) anticipate line jams before they happen... prevent downtime. Machines receive containers more uniformly, operate at higher rates for longer periods. Surge storage is provided between machines, ready to supply containers without delay. Millisecond sensing... plus stepless time delay for adjustment to each individual line!

PECO supplies the know-how... and PECO furnishes the Controls with the most successful use record... and the longest guarantee!

Your plant manager and plant engineer should have the PECO "Manual on Container Line Automation." Ask PECO now!

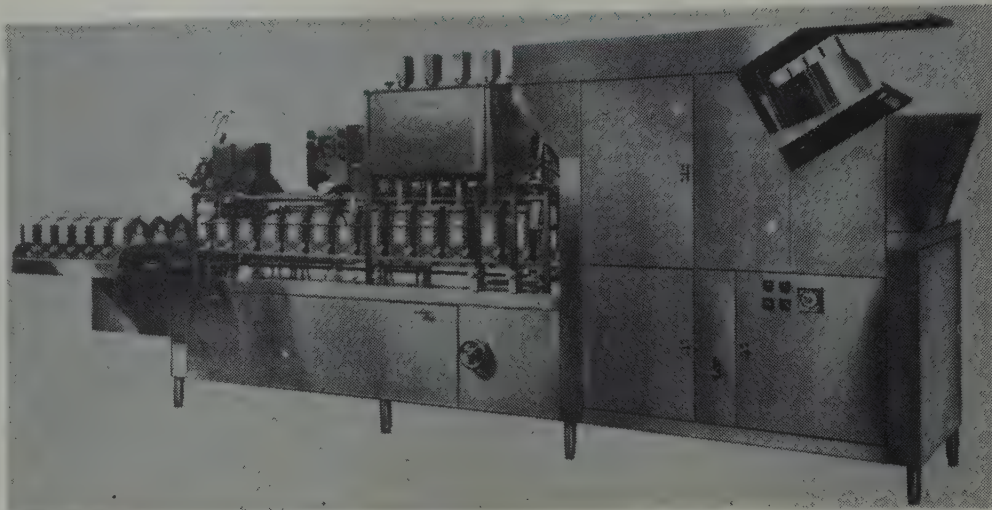
peco CORPORATION

Pioneers in Production Line Automation
111 Ortega Avenue, Mt. View, Calif. 94040

MACHINES

(CONTINUED)

NEW FOR PACKAGING



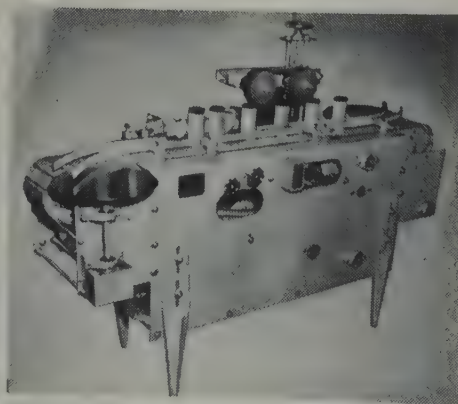
Packs Milk in Cartons or Plastic Bottles

A versatile form-fill-seal packaging machine allows small- and large-sized dairies to achieve added efficiency, lower operating costs, and use both paper and plastic containers. Called the Seal-O-Matic 340-U, machine enables dairies to form-fill-seal 1/2-gal, 1-qt, 1-pt, 1/3-qt, and 1/2-pt plastic-coated paper cartons on one unit. One man guides entire operation, with less than 15 min required to change carton size.

The machine converts quickly

to fill and cap Haskon's off-center-fill all-plastic bottles, with less than 15 min for changeover. The converted machine handles 6-qt (7/min), 1-gal (10/min), 1/2-gal (20/min), or 1-qt (24/min) containers. To change from paper to plastic, an input conveyor is added, capper is lowered in place, and timer reset for desired fill.—*Haskon, Inc., subsidiary of Hercules Incorporated, Wilmington, Del.*

Circle 344 on Inquiry Card



Free-Standing Coder

A new high-speed coding machine prints dates and numbers on various shapes and sizes of bottles and cans without cutting into existing conveyor lines. Identified as Kiwi model 15-72B, the 72-in. long coder has turntables at either end—one to receive

containers, the other to discharge them. Unit handles up to 24,000 pieces per hr, printing on flat, concave or irregular surfaces.—*Kiwi Coders Corp., Chicago.*

Circle 345 on Inquiry Card

Cuts Down Off-Weights

A new rotary net weight filler, the Concora 450, offers increased precision and accuracy. On Brussels sprouts of an average 2-oz piece weight, for example, the unit operated at an actual discharge rate of 170 cartons per min, with 94% good weighs of 10 1/4-oz average.

New unit requires only two persons on the line, a check weigher and an operator on form-



*When we promise you'll have your
flavor and color on time, bet on it!*

Large enough to meet every requirement and provide the most competent know-how in the industry; small enough to give you immediate service on every order and problem.

WARNER-JENKINSON MANUFACTURING COMPANY

Flavors and Colors for Foods

2526 Baldwin St., St. Louis, Mo. 63106 / 2515 Southwest Dr., Los Angeles, Calif. 90043

Circle 23 on Inquiry Card





If your products are odd shapes or neat cubes, Koch can film them fast!

SIX NEW IMPROVEMENTS IN FLEX FILM PACKAGE

1. Now pull a 99.8% vacuum, and believe us, *that's new!*
2. New freedom in the film market. We'll untie your buyer's hands... choose almost *any* heat sealable flexible film.
3. Any size package—25" x 31" x 7" in a single pouch; 15" x 11" x 2 3/4" web-fed. We haven't been stumped yet.
4. *Entire package* (outside, too) is sealed and cooled while under a vacuum.
5. Lowest leaker rate! How does 1% sound?
6. Economy! Low prices on nine models.



NO MATTER WHAT SHAPE your product's in, chances are good we can save you money when you vacuum package it. About 25% is the saving we hear about most often with the new freedom in film choice; now you can use *any* heat-sealable flexible film!

Haven't been stumped yet on size. We can handle it if it's under 31" long. Packages have a neat appearance; gone are the wrinkles and creases that make leakers. Use plain or printed film on fresh or frozen product, and we can show you how.

Nine models can take care of any need, from a table-top laboratory size all the way up to a high-speed web-fed model that offers 12 to 15 cycles (or 60 frank packages) per minute.

Our six improvements are real! To get all of the facts, please call (816) 753-2150 or write to Koch Supplies Inc., 1435 West 29 Street, Kansas City, Mo. 64108.

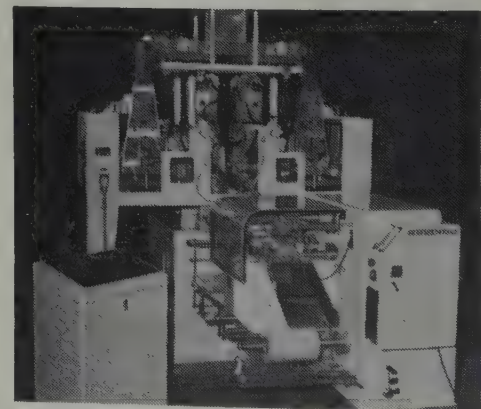
YOU CAN ALWAYS COUNT ON
Koch

New for Packaging

er-weigher. Unit is controlled by a sophisticated system of micro-switches, photo-electric cells and servo-rheostats. Interconnected memory circuits and relays permit machine to correct itself automatically, even to skipping a feed on carton inlet if product charge is overweight or underweight.—*Container Corp. of America, Chicago.* Circle 346 on Inquiry Card



LOW-COST THERMOFORMER is for small or varied production runs. Bocchi Series, MRB-13 "ECO" machines are manually operated, have a forming area about 27x19-in., positive and negative draws of about 7 1/2-in. — *Waldron-Hartig Division, Midland-Ross Corp., New Brunswick, N.J.* Circle 347 on Inquiry Card



Packs Pasta Products

The Rotopac HPM machine (Rovema) is designed to automatically form, fill, and seal flexible bags for long-cut pasta products. Machine prints and forms bag horizontally, drawing film over a forming tube. As longitudinal seal and cross seals

DRACCO® PLENUM PULSE™

Major Advance in Dust Collection Design

The new Dracco® Plenum Pulse collector makes bag changing a snap. All mechanical functions can be serviced from outside the unit. Just open the top cover doors to change bags. Each bag is held in place with a special quick-detach clamping assembly. What's more, you can see all the bags at a glance. A damaged bag is easy to spot and replace.

Superior reverse air management assures complete utilization of compressed air for pulse cleaning.

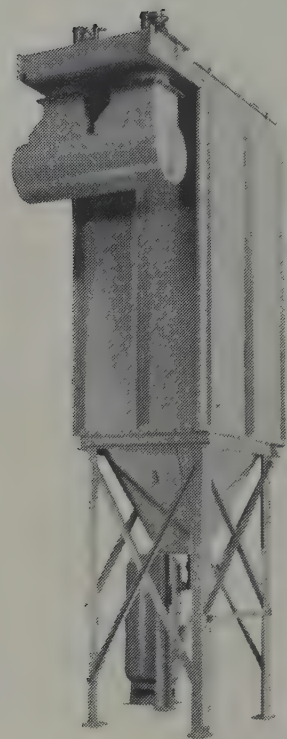
Higher cloth ratios may be utilized on ultra fine fumes because of controlled null after each pulse.

There is no need to shut down entire unit for bag inspection or changing since individual zones can be isolated.

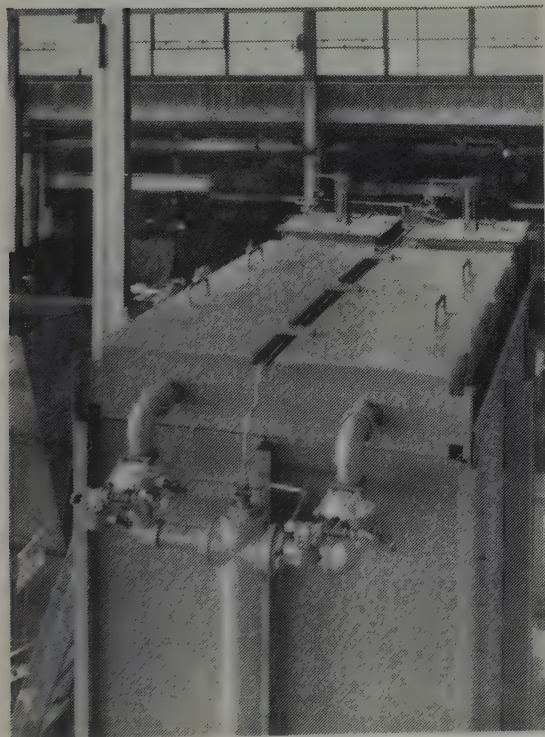
Each zone features a separate poppet air valve, so that all air is used for cleaning exclusively, and consequently your air requirement is reduced.

True modular building block design—5000 cfm (C 10:1) in less than a 5 ft. square.

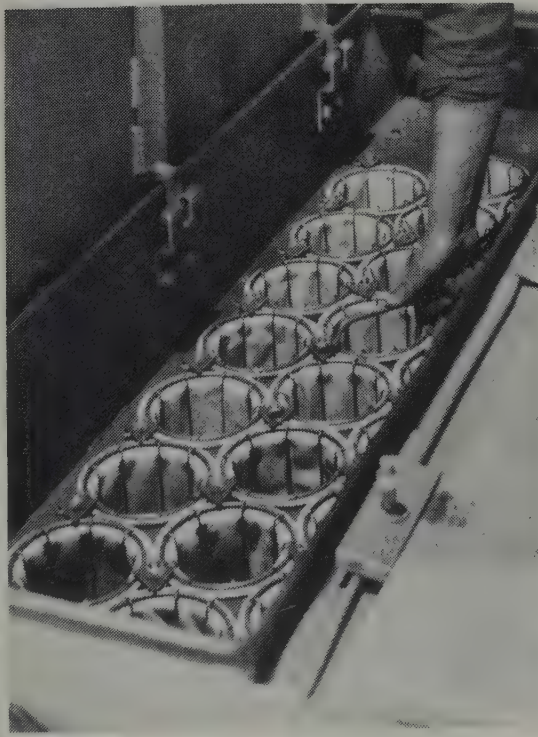
Find out more about Fuller's newest dust collector. Write for technical Bulletin DCB-14.



BAG CHANGING MADE 1-2-3 EASY



1 Twist the hold-down dogs and flip the top back.



2 Loosen the bolts and turn the clamp aside.



3 Remove the filter bag. It's that easy!

FULLER COMPANY / GENERAL AMERICAN TRANSPORTATION CORPORATION

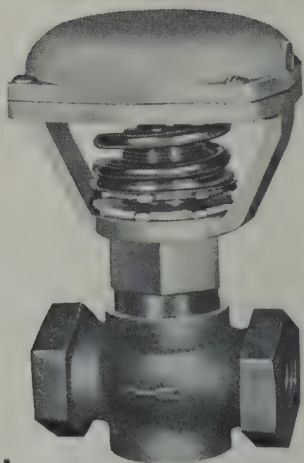
124 BRIDGE STREET, CATASAUQUA, PENNSYLVANIA 18032

COMPANIES AND AFFILIATES IN
PARIS, FRANCE • LONDON, ENGLAND • SAN SEBASTIAN AND MADRID, SPAIN • HAMBURG,
GERMANY • MEXICO CITY, MEXICO • TOKYO, JAPAN • SIDNEY, AUSTRALIA • DURGAPUR,
W. BENGAL, INDIA • MONTREAL AND TORONTO, CANADA • SAO PAULO, BRAZIL



GIANT MIDGET

Powerhouse Performance
in a Pint-Size Package . . .



Less than 9" in overall height, this compact Robertshaw diaphragm control valve does a giant-size job in controlling water, steam, gas, vacuum—you name it.

Bellows sealed for life-time protection against stem leakage. Designed for industrial use, with choice of materials, styles and valve-action best suited to your needs. (Single-seated; two-way or three-way; direct or reverse-acting.)

Bodies available in stainless steel for corrosive application. Molded Hypalon diaphragm enclosed in die-cast aluminum housing and frame. Choice of ranges, flow rate, valve sizes to 1½"; for hydraulic or pneumatic operation.

For complete data on the baby that does a man-size job, send today for Bulletin XF-40.

FULTON SYLPHON DIVISION
KNOXVILLE, TENNESSEE 37901



Exports: International Marketing Division, Richmond, Virginia ☐ In Europe: Robertshaw Europa N.V., Amsterdam

New for Packaging

are completed, product is fed by plunger through the tube and into the bag. Two continuous belts move the filled, sealed bag off the tube to takeaway conveyor.

Unit handles variety of wrapping films, with rapid conversion from heat sealing to impulse sealing. Package sizes range to 2-lb for macaroni and 4-lb for spaghetti, with speeds up to 40/min. —Pneumatic Scale Corp., Quincy, Mass. Circle 348 on Inquiry Card



COMPACT RINSER (400 Rinser) is especially designed to remove dust and debris from one-way bottles. Bottles are fed into carrier pockets in rows of four by means of a star-wheel, a bottle injector cam, and two cam-operated gates. In the pockets, the bottles are conveyed upward and are inverted over stationary sprays. They are allowed to drain; then are discharged upright. Fully automatic unit is driven by one motor and operates with minimal maintenance.—Barry-Wehmiller Co., St. Louis, Mo.

Circle 349 on Inquiry Card

TOP-PRINTING MACHINE . . . for cans or bottles handles up to 1,000/min. Timing screw separates containers to printing head, which has fully enclosed ink fountain.—Gottscho, Inc., Hillside, N. J.

Circle 350 on Inquiry Card

MULTIPLE-NOZZLE HEAD . . . extrudes hot melt to seal case, cartons and bags. Comes in 4- and 8-nozzle models.—Nordson Corp., Amherst, Ohio.

Circle 351 on Inquiry Card

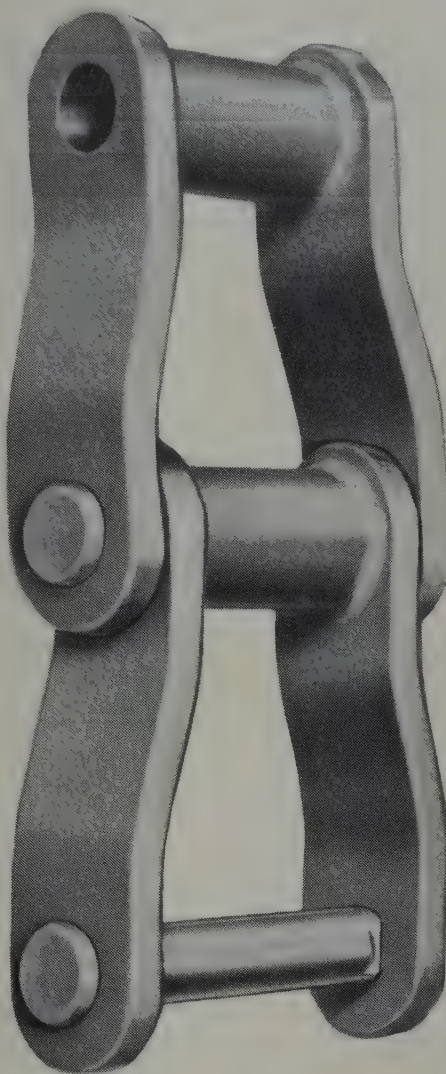
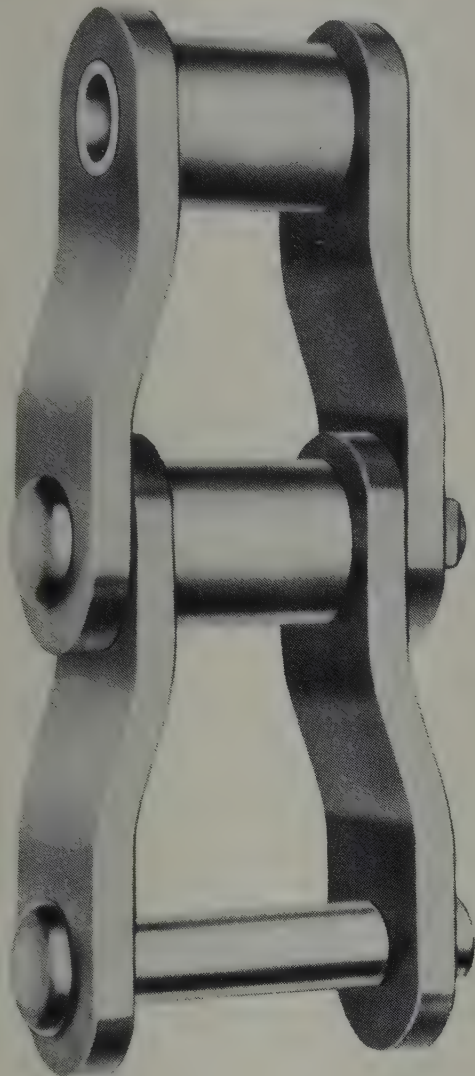
COMPACT GLUE SEALER . . . is only 6-ft long, seals 50 cases/min. Mini-Midget's patented adhesive system eliminates compression section.—General Corrugated Machinery Co., Palisades Park, N. J.

Circle 352 on Inquiry Card

1

STR Drive Chain

Positive yet flexible way to transmit power for unit machinery, general industrial drives, heavy duty elevating and conveying service.



2

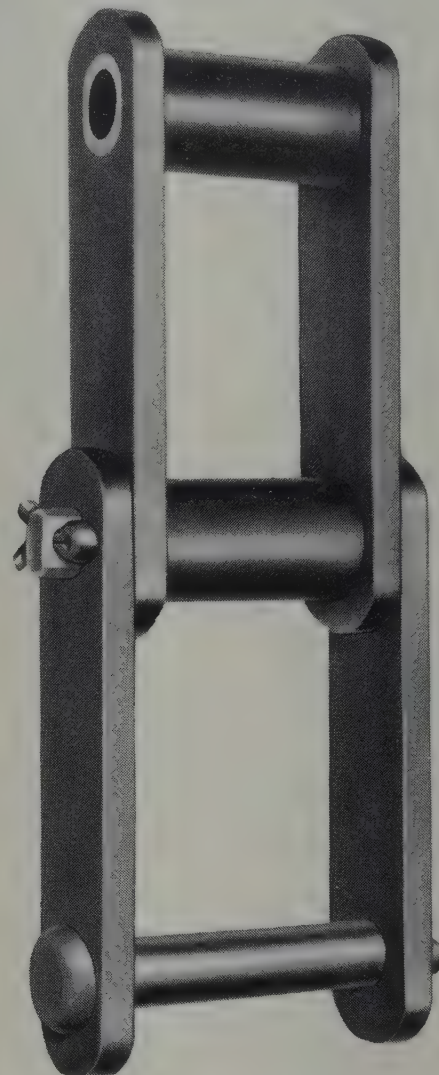
Welded Steel Chain

Lasts longer because it's precision made of rolled steel stock that's laboratory tested before the chain is manufactured. Copper-bearing steel is used to combat corrosion. Attachments: plenty, in stock or special made.

3

Steel Knuckle Chain

For conditions where unusually strong, rugged chain is demanded. Many applications of this design are available to fit virtually any need.



Three reasons why you might call Jeffrey the Chain Leader

Next time you visit the market for chain, check Jeffrey. Chances are we either have what you need, or can make it. But, please, don't come to us if you want "just any old chain." That kind we don't have. Years ago, Jeffrey decided to go the quality route, and we won't change now. For proof of our quality, ask your Jeffrey Distributor. Or write Jeffrey Manufacturing Co., division of Jeffrey Galion Inc., 927 North Fourth Street, Columbus, Ohio 43216.



INVISIBLE PARTNER...for powdered foods



McCormick & Co., Inc., Baltimore, Md.

Syloids® act as tiny cushions to keep your product from compacting

SYLOID MICRON-SIZED SILICA GELS are your best insurance against the compaction that can turn a bag or drum of food powder into a solid mass. Added to the product in concentrations of less than 1% by weight in many instances, Syloids are colorless, odorless and tasteless. They become, in fact, invisible. Each of the millions of tiny particles acts as a miniature cushion, keeping the food particles separated and free-flowing. At the same time, they act as sponges, trapping any moisture or oil that might cause product damage. Syloid additives have FDA clearance for use in dried egg yolks, and whole powdered eggs as well as all non-standardized food products.

SEND FOR DAVISON'S NEW SYLOID FOOD BROCHURE . . . PA-77. You may find that you can improve your product with this invisible partner in your package. Write to: W. R. Grace & Co., Davison Chemical Division, Pigments & Additives Dept., Baltimore, Maryland 21203, or your nearest Syloid distributor.



DISTRIBUTORS: U.S. Boston, New York—D. H. Litter Co.; Baltimore, Philadelphia, Pittsburgh—Van Horn Metz & Co.; Atlanta, High Point, N.C.—Deeks & Co., Inc.; Cincinnati—Deeks & Co.; Cleveland—Dimlich-Radcliffe Co.; Detroit—D-R Chemical Co.; Chicago—Donald R. Fitzgerald Co.; St. Louis—G. S. Robins & Co.; St. Paul, Kansas City, Kan., Denver—George C. Brandt, Inc.; New Orleans—North American Sales Co.; Dallas—Ashland Chemical Co., Ribelin Distributors, Inc.; Houston—Ribelin Distributors, Inc.; Seattle, Portland—Benson Chemical Corp.; San Francisco—Carmona Chemical Co.; Los Angeles—E. T. Horn Co.; CANADA Montreal, Toronto, Winnipeg—McArthur Chemical Co., Ltd.; Calgary—Davison Chemical Co. Ltd.; Vancouver—Emchem Sales Ltd.; MEXICO Mexico City, Monterrey, Guadalajara—Watson-Phillips Y Cia; CENTRAL AND SOUTH AMERICA Pluess-Stauffer (New York City). Also manufactured in Europe and the Far East by W. R. Grace & Co., Overseas Chemical Div., 7 Hanover Square, New York City.



The Fifteenth Earl of Beltwear

The ghost of this mad anti-productionist of the 14th century still haunts modern production lines and often breaks a metal conveyor belt. Here's the fastest way to repair his damage:

Call us. USS CYCLONE Metal Conveyor Belts are warehoused nationwide in ten cities for fastest delivery. Your order is on the road fast...from a location near you.

Chicago, Ill.....312 • 646-2500
 Newark, N.J.....201 • 248-2600
 Braintree, Mass.....617 • 848-0375
 Atlanta, Ga.....404 • 457-6336
 Fort Worth, Texas.....817 • 335-4371
 Tulsa, Okla.....918 • 582-2227
 Cleveland, Ohio.....216 • 523-3650
 Oakland, Calif.....415 • 652-2060
 Houston, Texas.....713 • 523-1613
 Los Angeles, Calif.....213 • 245-2635

Or call your United States Steel CYCLONE Sales Representative.

We warehouse standard weight and heavy duty Galvanized Flat Wire Belt in a wide variety of widths. We also carry FLEX-GRID Belt in tinned wire in both 9 gage, 1/2" pitch, and 7 gage, 5/8" pitch, in several standard widths. And we have sprockets and turn conveyor units to go with these standard specification belts. Spiral mesh belts or belts to other specifications are manufactured and can be stocked to your individual requirements at any of our warehouse or mill locations convenient to your operation. Our manufacturing plants are located at North Chicago, Illinois, and Oakland, California.

Our new warehousing program is only one of the USS CYCLONE exclusives. When you buy CYCLONE you deal directly with

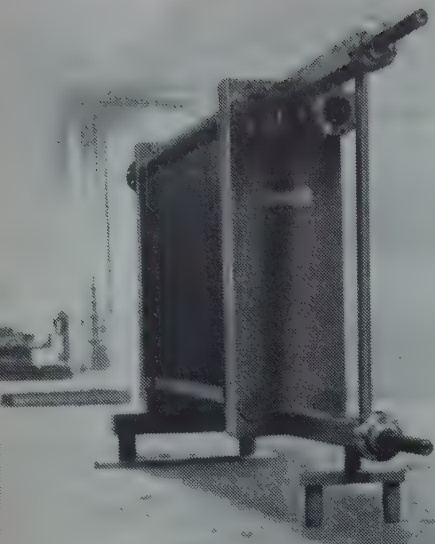
the manufacturer so you get complete engineering and design assistance. Nobody can serve you with as many sales offices (60) or as many field service representatives. It's also good to know that we make more types of metal conveyor belts than anyone, so we can put the *right* belt on your line.

Write to U. S. Steel and ask for a copy of our brochure, "USS CYCLONE Metal Conveyor Belts" (ADUSS 60-3420). U. S. Steel, P. O. Box 86 (USS 5246), Pittsburgh, Pa. 15230. For the address and phone number of the nearest CYCLONE Sales Office, look in the Yellow Pages under Belting, Mechanical; or Fence.

USS, CYCLONE, and FLEX-GRID are registered trademarks of U. S. Steel.

USS Cyclone Conveyor Belts

Circle 29 on Inquiry Card



A De Laval plate heat exchanger takes up 1/10th to 1/2 the floor space of a tube and shell type to do the same job. Heats or cools nearly any free-flowing liquid. Cleans by circulation without disassembly. Enlarges or rearranges if your capacity or process changes. Want details?



DE LAVAL

Just contact the De Laval Separator Company,
Poughkeepsie, New York; Chicago, Ill.; Burlingame, California.

Free floor space



dream a little

(You could start a national institution!)



Yankee noodles? Why not? Sell them stuffed with *Maryland* crab, *Texas* beef, *Georgia* peaches . . . right on through 50 state foods. Come to think of it "Yankee Noodles Dandy" isn't so far fetched!

The future of your company, the nation, and the world depends on the development of new foods. One expert claims an average of 58 product ideas is needed to develop one profitable item. What to do?

Dream A Little.

How? After you have come up with several possibilities, eliminate the weak . . . improve the strong. During the process, questions will probably arise on how to develop better texture and taste appeal, extend shelf life, prevent weeping, add body, optimize consistency, and many others. The Atlas Food Laboratory has answers to most of your questions, or our food scientists can find answers especially for you.

We're happy to provide this ser-

vice. It is our duty to help our countrymen! Later, when you buy Atlas surfactants and polyols, your loyalty will be our honored award.

Need answers now? Issue a call to arms for Atlas technical service.



**ATLAS CHEMICAL
INDUSTRIES, INC.**

WILMINGTON, DELAWARE 19899



PACKS PAN-READY



SPUDS IN PVC

Fresh, ready-to-cook hash browns in a PVC tub have a refrigerated shelf life of eight weeks. Patent is pending on both process and package

GAS FLUSHING TURNTABLE rotates counterclockwise. Filled tub enters bottom center and receives lid, then moves to right where a plastic shield is placed over it. A vacuum is drawn, inert gas is applied, then lid is sealed. Package is pushed off table at left.



WHITE PVC TUB for "Hash Brown Potatoes" holds four 3-oz servings. Product is fried in hot oil until bottom browns, then turned and browned on the other side. Foil lid can be reclosed to keep unused product fresh.

REFRIGERATED POTATOES, shredded and precooked for easy-to-make fresh hash browns, are being packaged by Redi-Spuds of America, Los Angeles. Redi-Spuds claims a shelf life of eight weeks for the refrigerated product. After being opened, the contents stay fresh for about five days under refrigeration.

Redi-Spuds has a patent pending on both the process and package for use in the potato industry. And interest in licensing the process has already been expressed by several U.S. and European manufacturers.

Uses PVC Tubs

In the process, Idaho and Oregon russets are precooked (about 80%), during which sodium bisulphite anhydrous preservative is added. Then the cooked potatoes, usually smaller varieties, are toted to a sterile packaging room which is cooled to about 45F.

Product is packaged in opaque PVC tubs, chosen for good gas-barrier properties. The standard duplex foil laminated lids have a special adhesive that resists oil smudges. Each lid is lithographed in five colors with brand identification and cooking instructions.

The packaging line runs at 35 packages/min. It begins with a tub dispenser adjacent to a Brothers shredder, from which product is dumped into a Hollymatic patty maker (Model SS). Size of the patty produced can be controlled to compensate for changes in product density. Flow of tubs from the dispenser is controlled by a photo cell, at a rate corresponding to the output of the patty maker.

The most critical part of the packaging opera-

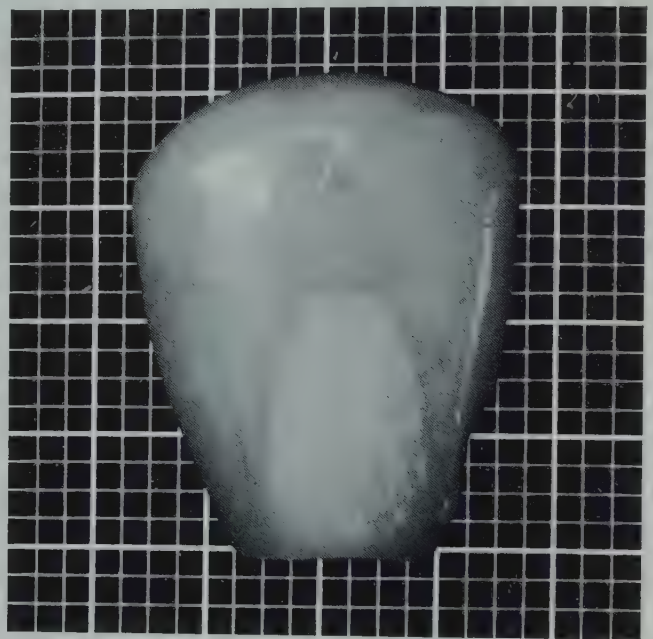
tion involves flushing the tub with inert gas during sealing. Each open tub slides off the wire conveyor into a special machine consisting of a rotating plate with a series of openings corresponding to the size of the tubs. After the foil lid is put in place automatically, the tub rotates under a plastic sheet that forms a top seal on it. Vacuum is drawn on the open tub, partially removing the air, while inert gas at 30 psi is applied through the plastic shield. While holding the same inert atmosphere, the package revolves to the lid-sealing chamber in the same machine. The package is date-stamped automatically as it leaves the line. Each package's vacuum seal is tested before going into a carton.

Consumers like the product, which sells at about 29¢/12-oz package, because of the time saved when using refrigerated rather than frozen potatoes. They also like the flavor and appearance, and the ease of cooking.

Lloyd Shapoff, president of Redi-Spuds, says consumer reception is so good that he plans to expand the line to include fresh French fries, hash browns with onions, fresh stuffed baked potatoes (bacon, cheese or onion flavor) that will cook in 12 min against 45 min for frozen potatoes, and fresh potato pancakes.

Some new techniques will have to be used to package fresh French fries, using a new filling machine and a different inert gas. Redi-Spuds is eyeing a 9-oz package of the French fries to retail at 25-29¢. Baked potatoes still present some packaging problems, but these are not considered insurmountable. The package planned for the baked potato will be translucent for maximum consumer appeal. (End)

the Urschel method of preparing Cream Style Corn is best... here's why



with BOTH the Kernel Component and Cream Component...

- particles are cleanly cut to your size requirements by Urschel cutting methods
- to preserve kernel identity
- to make a product free from loose skins and free from variable consistency
- at high capacities and free from burning
- tried and proven equipment fits easily into your present corn line
- with minimum machine maintenance



Urschel SPS
Kernel Slicer for
clean cut kernels.

Urschel Comitrol® for
controlled comminution.
(cream component)



URSCHEL
LABORATORIES INCORPORATED
VALPARAISO, INDIANA 46383 U.S.A.

URSCHEL BOOTH 706 CANNERS & FOOD SHOW
SAN FRANCISCO, JANUARY 19-22

DESIGNERS AND MANUFACTURERS OF PRECISION, HIGH SPEED CUTTING EQUIPMENT FOR FOOD PRODUCTS

INGREDIENT NEWS

3 Points to Study About Sweeteners

At the American Institute of Baking Conference, Sept. 23-24, 1968, Mr. Edward R. Piekarz, Fleishmann Div., Standard Brands Inc., presented three questions to the group on comparing sweeteners in bakery operations.

Do you judge the ingredient on its delivered price or on its in-plant handling performance, affect on dough cost and on bread quality? Can the liquid sweetener be handled in your bulk system easily and without adversely affecting shop conditions and physical limitations? Is your evaluation of the bread based on your preference and not on how sweet it is?

Mr. Piekarz feels that these simple points are too often overlooked when comparing sweeteners.

Develops Line of Dairy-type Flavors

Line of artificial flavors imparts a dairy flavor to products that imitate fluid milk, sweetened condensed milk, coffee whiteners, sour creams, and buttermilk flavored pancakes.

Also they can be used to impart flavor in products that rely on dairy type flavors. These include replacements for sour cream and buttermilk in bakery products.—*Givaudan Corp., New York City.* Circle 266 on Inquiry Card

HYDROLIZED VEGETABLE protein enhances or develops beef-like or bouillon flavor in soup and gravy bases, bouillons, snack items, meat products, sauces and vegetables.—*Fleischmann Div., Standard Brands Inc., New York City.* Circle 267 on Inquiry Card



MASHED BANANAS and honey is available in No. 10 cans, packed 6 to a case. Bananas with pure white clover honey offer new product ideas as a flavoring ingredient. One developed product is banana and honey ice cream.—*United Fruit Sales Corp., Boston, Mass.*

Circle 268 on Inquiry Card

Crystals Fortify Milk

Pre-measured concentrates (two) will fortify either 100 gal. or 500 gal. of milk to the minimum adult requirements of Vitamin A, B₁, B₂, D, Niacin, Iron, and Iodine.

Crystals are packed in heat-sealed foil envelopes, and require no refrigeration. Dry product can be added to the surface of the milk in a vat without preparing a premix.—*General Mills, Specialty Products Div., Minneapolis, Minn.* Circle 269 on Inquiry Card

RUM FLAVOR imitates Jamaican Rum. Use includes baked goods, confections, and desserts. And it enhances other flavors at levels of 5% total flavor. — *Rhodia Inc., New York City.* Circle 270 on Inquiry Card

MINCE PIE FLAVOR provides taste of cooked mincemeat and retains character at high baking temperatures.—*Henry H. Ottens Mfg. Co., Inc., Philadelphia.* Circle 271 on Inquiry Card

Sure, the same versatile SCHWITZER AIR PUMP can be installed horizontally or vertically, operate in either direction, and provide 10 PSI at 400 CFM or 15 PSI at 800 CFM. And, SCHWITZER Air Pumps save you MONEY!



SCHWITZER AIR PUMPS

The strong heart of the pneumatic conveying system.

Schwitzer offers you "a whole new concept in AIR POWER"... a highly versatile line of positive displacement, rotary air pumps, designed to help you solve a wide variety of industrial processing and pneumatic conveying problems... quickly and efficiently.

- **Pressure ratio**—2.0 negative or positive
- **Application**—Vertical or horizontal drive clockwise or counter-clockwise
- **Operation**—Parallel or staged—symmetrical design
- **Lubrication**—Self contained—all bearings
- **Parts**—Completely interchangeable
- **Availability**—Off-the-shelf—volume produced—also complete power units
- **Service**—Complete advanced replacement program
- **Accessories**—Inlet filters, outlet mufflers, check plates.

For complete catalog, including all specifications and performance curves, ask your pneumatic systems manufacturer or write direct to:



INDUSTRIAL PRODUCTS GROUP
SCHWITZER

Division Wallace-Murray Corporation
P. O. Box 50066, Indianapolis, Indiana
Phone 253-4050

OUR 50th YEAR!

SLURP

We tried and we tried to come up with a picture that showed how Lactose holds and enhances the flavor of dairy products. But no picture can capture how much fuller and richer and natural dairy foods taste with Lactose in them.

Hence, the above slurp; which, as you may know, is the sound people make when they're eating something that is delicious.

And make no mistake about it, dairy foods with Lactose are delicious enough to make people slurp. Or go

yum-yum, as the case may be.

LACTOSE FROM
FOREMOST INDUSTRIAL

111 Pine Street, San
Francisco, California
In Canada: Peebles
Products, Ltd.

FOREMOST FOODS COMPANY



AIRCO'S MAN FROM C.O.L.D.

can beef up your CO₂ yield



We'll give you all the CO₂ you can use. But why waste it? You keep the bloom on your meats and on your profits, too, if you know what's new in the field.

That's where our Man from C.O.L.D. comes in.

He's trained to give your place the once over. From filet mignon to sausage. From the kill to the package. If there are ways to improve your CO₂ operation, he'll

spot them. The things you haven't the time or the research facilities to take care of. And you'll be better off because of him.

Why not call in a Man from C.O.L.D.? He's as much yours as ours. Get him through the Airco office near you, or write Airco Industrial Gases, 150 East 42nd Street, New York, N.Y. 10017.

AIRCO
Industrial Gases

TANK TOWN U.S.A.



Springfield, Missouri — where the PAUL MUELLER COMPANY, at the crossroads of America, makes stainless steel tanks to any specifications; ships them out the day they're promised, and builds them to last longer.

Sound like a big order? Try us. You specify the features; MUELLER Temp-PlateTM heat transfer surface, insulation, agitation and delivery requirements... We'll take it from there.

MUELLER stainless steel tanks are at work in industries all over the free world; preferred for the craftsmanship that goes into them and the dependability that gets them to the job on time.

MUELLER
Springfield, Missouri U.S.A.

PAUL MUELLER COMPANY

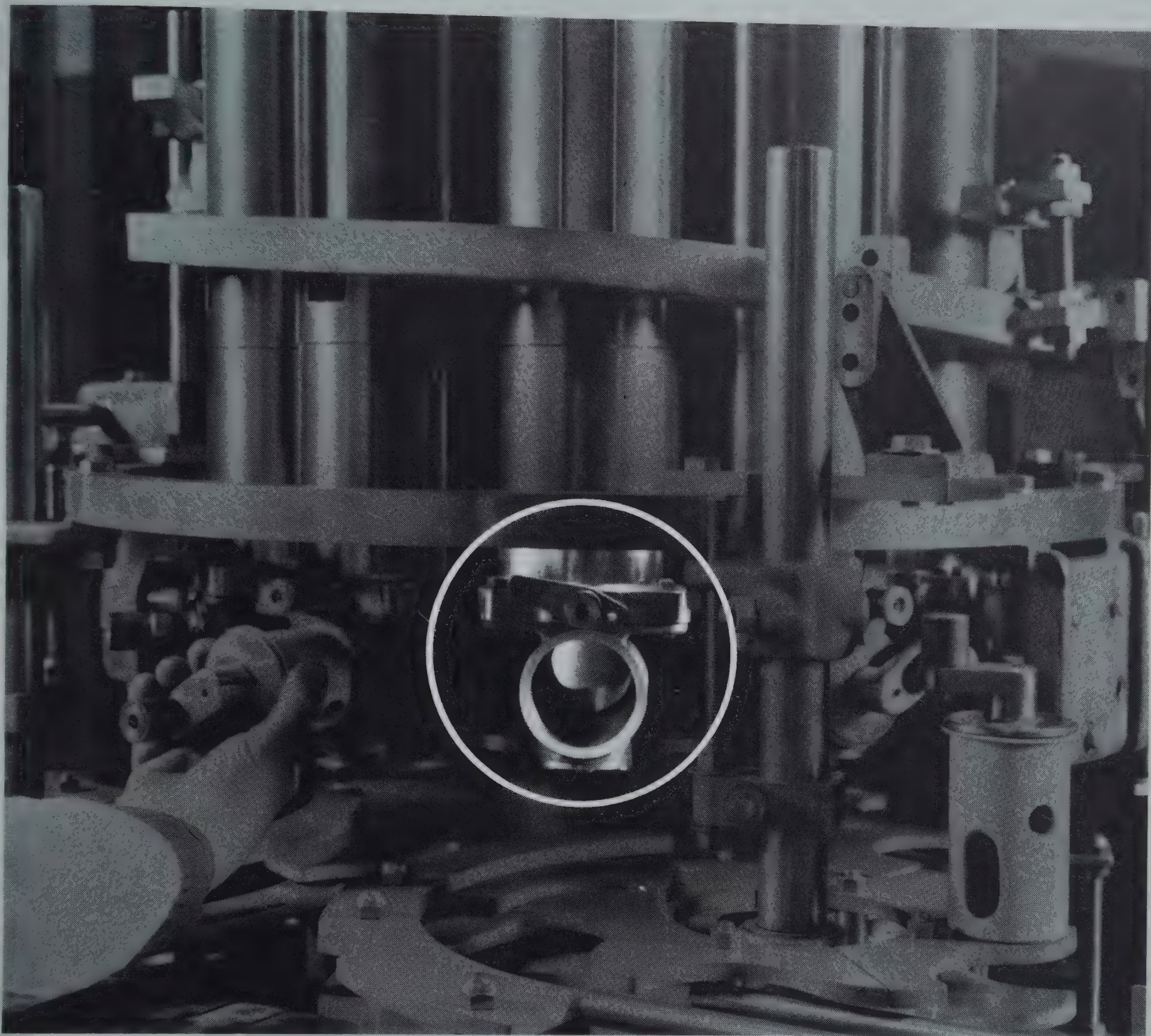
P. O. BOX 828 / SPRINGFIELD, MISSOURI, U.S.A. 65801

TELEPHONE: (417) 865-2831 / CABLE: MUELLER

TELEX: 43-6427



CANADIAN PLANT
MUELLER / RICHARDSON Ltd. / ST. MARYS, ONTARIO



You can see clean thru a Pfaudler® filler.

You know when this rotary piston filler is clean. You can see right through the valve body into the filler bowl.

And, from shutdown to your final visual inspection, it takes only 30 minutes to clean a Pfaudler filler.

Just two parts to remove per station. Valve plug twists and slides out. Piston lifts up and out.

Then you flush down all product contact surfaces . . . and see the results.

On line, you can count on a Pfaudler rotary piston filler to give you $\pm 1/10$ fluid ounce with most products. Handle from one ounce to five quarts per fill, depending upon your choice, from a small 6- up to a giant 36-station machine. Each one is compact, solidly built, simple to run, and easy to maintain.

Send for our new Bulletin 1057. Write: The Pfaudler Co., Dept. FE-128, Rochester, New York 14603.

This is your year for...

PFAUDLER
DIVISION OF RITTER PFAUDLER CORPORATION



← Circle 36 on Inquiry Card

Circle 37 on Inquiry Card

Circle 38 For Following Advertisement →

Meet the CA...

one more example of what's different about Cleaver-Brooks steam generators

Cleaver-Brooks line of CA steam generators includes a wide range of unique features . . . supplies saturated or superheated steam from 60,000 to 175,000 pounds per hour. All are equipped with 2½" O.D. full-length tubes throughout . . . a 42" I.D. steam drum . . . two 24" O.D. water drums with manholes at each end. A superior combination not found in any competitive design.

What other choices does Cleaver-Brooks have for you? Firetube units from 12 through

700 hp. DELTA-type watertube steam generators from 12,000 to 75,000 pounds of steam per hour. Commercial watertube designs from one to six million Btu per hour input. A complete line of accessory equipment. And the largest packaged steam generator service organization in the country.

How can we serve you? Find out from our nearby representative, or write direct. Cleaver-Brooks, Box 421, Milwaukee, WI 53201.



BOILERS FIRED WITH IMAGINATION

Cleaver  **Brooks**

DIVISION OF AQUA-CHEM, INC.



The Allen-Bradley distributor in your area carries your control center in stock

Telephone your local A-B distributor and he will deliver to you—from his stock—all the components necessary for the control center which you require.

The sectionalized mounting frames are complete with all necessary hardware. They can be erected—at the site—in a matter of minutes, and will then be ready to accept A-B combination starters in ratings from Size 0 to Size 5. The enclosures for these starters have been designed so that they will fit as "building blocks" on the mounting frames.

The AB Modular Control Center can be tailored to your particular job with non-reversing, reversing, and multi-speed starters. When the required starters do not completely fill the mounting frame, blank panels can be furnished at a nominal price to cover up the empty spaces. Special enclosures are available, arranged for mounting contactors, timers, relays, and similar control

An AB Modular Control Center can consist of one or more sections, accepting starter ratings from Size 0 to Size 5.

devices. Additional frames can easily be added to the original installation whenever this becomes necessary. Allen-Bradley NEMA Type 1 or Type 12 combination starters can be used in the one standard frame assembly.

Have your local Allen-Bradley distributor demonstrate this new AB Modular Control Center—you will immediately recognize its money saving value. Furthermore, with all items in the A-B distributor's stock—including the required starters—a modular control center consisting of many sections can be installed and in use in a matter of two or three weeks. For an equivalent, completely assembled control center, a shipment promise of 16 to 20 weeks is common—and before it is installed and ready to be connected to power, many additional weeks will have passed. Allen-Bradley Co., 1201 South Second St., Milwaukee, Wis. 53204. Export Office: 630 Third Avenue, New York, N. Y., U.S.A. 10017.

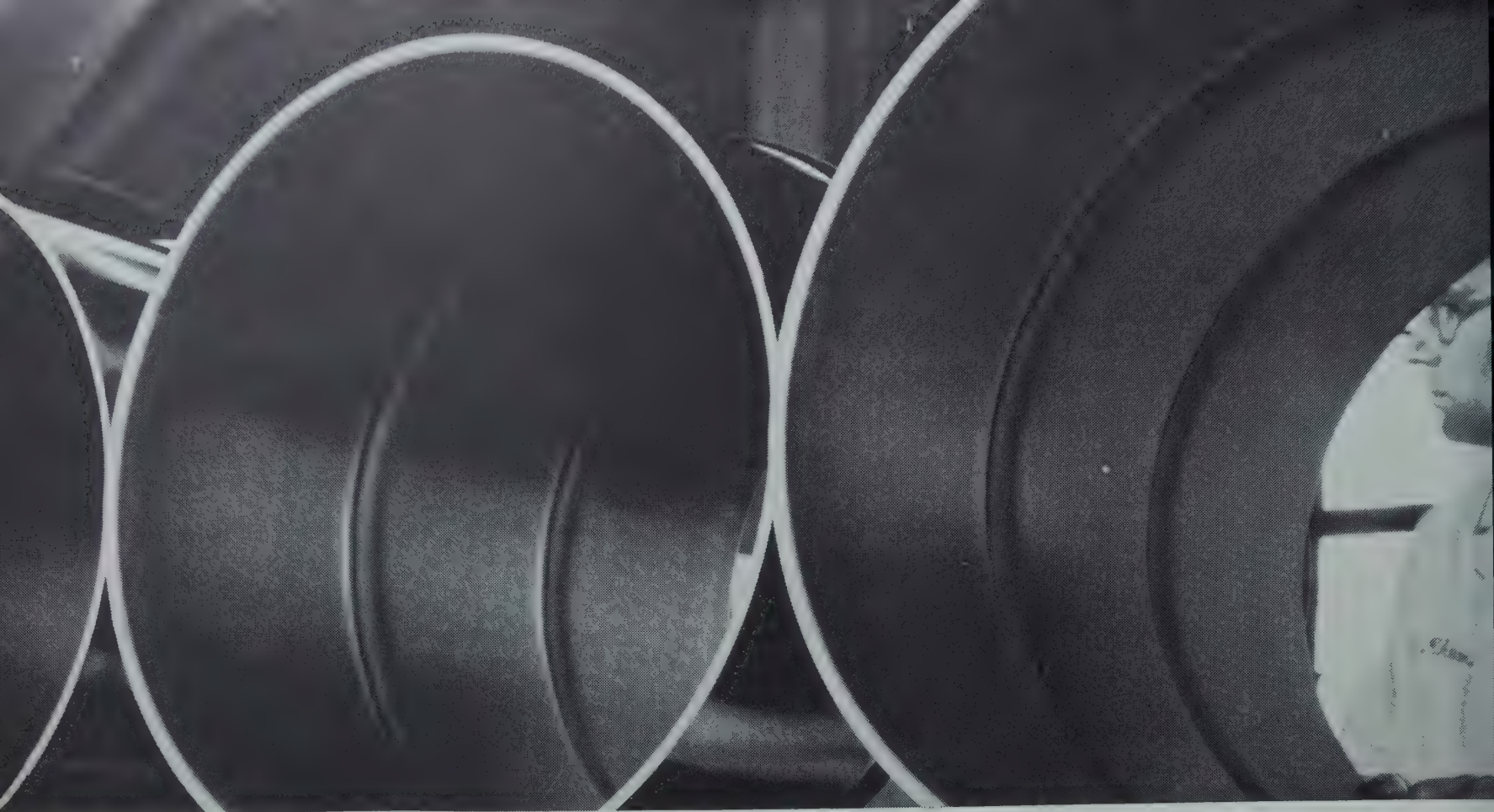


ALLEN-BRADLEY

Member of NEMA

QUALITY INDUSTRIAL CONTROL

Circle 39 on Inquiry Card



No pinholes...no blisters... no skips...no globs...naturally.

The natural way is the best way to do a job. That's why we use simple, reliable centrifugal force to line the cylinders of Rheem packages.

In the patented Centrifugal Method, the applicator head is round, conforming to the shape of the shell. It whirls rapidly, depositing the fine lining particles in uniform amounts as the cylinder reciprocates around it.

The result of this natural method is a lining thickness that varies less than one-tenth mil, over the entire surface. Because there's no compressed air, there's no air turbulence to divert the coating and cause thin spots.

The process is automatic. So there's



no problem with operator fatigue or inattention—or skips in the film. It requires less solvent in the lining material. So these vehicles are less likely to leave holidays during curing.

Curing is done vertically with warm, regulated air that flows upward, naturally, through the shells. So the lining is uniformly cured, too.

So don't just order drums and pails. Get complete protection for your products. In Rheem containers, naturally.

Our complete package for you begins with an analysis of your container and lining needs. To arrange for it or to get more information, write us at 1701 W. Edgar Road, Linden, N.J. 07036.

WORLD'S LARGEST MANUFACTURER OF STEEL SHIPPING CONTAINERS

Circle 40 on Inquiry Card



Only Sure Thing About Fats Is Uncertainty

American Heart Assn. on October 30 affirmed its earlier dietary advice. It urged control of saturated fat and cholesterol to reduce the chance of heart attack.

But as before, the AHA statement fails to completely prove its case. As American Dairy Assn. says, the statement is based on incomplete scientific evidence.

As a matter of fact, the AHA itself makes several points that add confusion to an already muddled situation. Here are some of them:

Qualifications complicate situation

► Much of current data on diet and heart disease is from studies of subjects atypical of the general population. There is urgent need for a nation-wide study involving large numbers of healthy people to provide an unequivocal answer to whether lowering cholesterol levels can reduce heart attacks.

► The ideal quantity of fat needed in the diet is not known.

► Polyunsaturated fats probably should comprise twice the quality of saturated fats. [The word "probably," of course, indicates uncertainty.]

► Cholesterol is abundant in many protein foods of high biological quality. So careful planning is necessary to lower the intake of cholesterol without impairing the intake of foods high in protein.

► Diets severely restricted in fats, with carbohydrate filling out the caloric requirement, may in some individuals accentuate hypertriglyceridemia (an excess in the blood of neutral fats). While the exact role of triglycerides is not clearly established, there is increasing evidence that hypertriglyceridemia is associated with an increased incidence of coronary disease in younger men.

To further point up the uncertainty of AHA's recommendations, consider these comments by American Dairy Assn.

ADA makes some telling points

► The American public has been consuming less animal fat and more vegetable oil for many years, as advocated by AHA. Yet the incidents of heart disease as the cause of death in the same period have drastically increased.

► Dr. Harry J. Johnson, chairman of the medical board of Life Expansion Institute, noted recently that before 1930 coronary heart disease was relatively rare. From 1930 to 1960, incidents rose 2,000%.

► Even the experts can't agree. For example, Dr. E. Curler Hammond, American Cancer Society, recently issued the results of a 6-yr. statistical study with 800,000 people. He stated that "death rates from heart attacks and strokes were lower in groups who consumed large amounts of cholesterol in their diets than for people who consumed little cholesterol."

It would seem that the only certainty in the situation is that further research is needed. And to the extent that the food industry and its associations sponsor such research, they will be performing an important public service.

Meanwhile, food companies will be well advised to continue to use caution in interpreting AHA statement.

And the AHA recommendation that labeling regulations be changed to permit declaration of the actual polyunsaturated fatty acid content of a food seems not to be justified at this time.

Black Out!



**Think stains like this
can't be cleaned?**



**You're wrong!
Just call us.**

We'll make stubborn stains do a fast disappearing act for you . . . as we have for other food processors like the one who gave us his ham molds.

His problem: difficult processing stains on molds like the one shown above on the left. It had already been cleaned by regular methods.

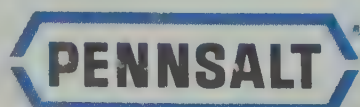
Uncleanable? Not at all.

His local Pennsalt representative had a similar mold spotless and gleaming in no time, using a special cleaner from our wide-ranging line of B-K® cleaners and sanitizers. A quick soak and rinse had this and other molds looking like new.

Have you a nagging problem with cleaning plant utensils and equipment? Chances are we've got the cleaner ready to go right off the shelf. In the rare instance where we're stumped, we'll put our scientists to work on it at Pennsalt's Technological Center until they come up with the cleaner to do the job.

Let's hear from you. You have nothing to lose but your stains.

Dairy and Food Department, Pennsalt Chemicals Corporation,
3 Penn Center, Philadelphia, Pa. 19102



Circle 41 on Inquiry Card

For Food Technologists Only

Send a Cow to camp!

We need your support. Cows are great. For other cows. And for kids who need fresh milk to grow big and strong. But for food technologists like you, all a cow does is get in the way of a lot of your great ideas. We're talking about the ideas that call for fresh or condensed milk products or dry whole milk powder. They're expensive. Often their expense kills your great ideas before they get off the ground.

So. This campaign. Sheffield makes great non-dairy coffee whiteners, whip bases and complete dry whip products. They cost less than comparable dairy products yet do everything those dairy products do. They've got shelf lives of months, not days. They're nice things to have around when a great idea strikes. Find out about them. Join our campaign. If enough of you think enough of cutting costs and turning great ideas into great foods, who knows how many cows we can retire to a life of leisure. Sheffield Chemical, 2400 Morris Avenue, Union, New Jersey 07083.



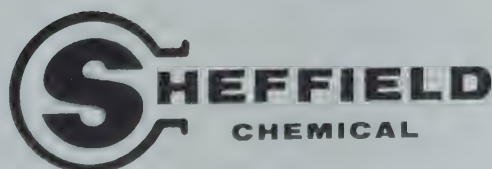
Yes. I'd like to join your Send A Cow To Camp campaign. Please send me literature on Sheffield Group 5 products.

Name _____ Title _____

Company _____

Street _____

City _____ State _____ Zip _____



DIVISION OF NATIONAL DAIRY PRODUCTS CORPORATION

Pick our package

Let's begin with a product. Your product. Maybe it's a one-shot first aid kit. Or moist modeling clay. Dessert topping. Cottage cheese. It could even be something as exotic as Mediterranean squid. You name it.

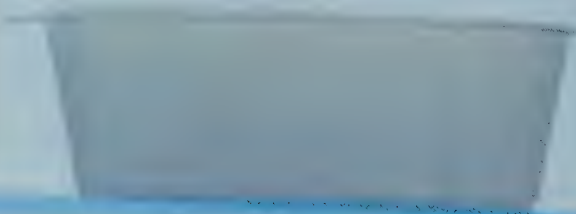
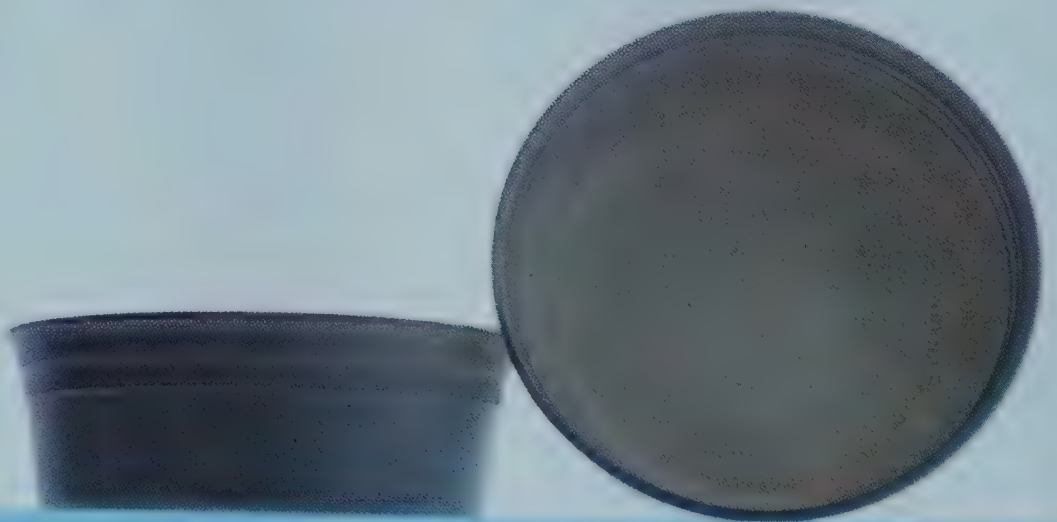
Now let's select a Sealright package for it. The right one. Right out of stock.

A table-ready package, that carries your product directly to the consumer. Of thermoformed or injection-molded plastic. In almost any basic shape and size.

We'll top it with a lid that adds even more sales sizzle. Like our snap-on reclosable lid. Or our two-piece, tamper-proof, self-locking lid.

And if your product is the kind that sells itself, we'll be glad to give it the see-thru heat-seal treatment with strong transparent film.

Point is, we've got stock answers to a whole series of packaging problems. Try us. See if we don't come up with the package that sells your stock. Like never before.



Pick our brains

We say the package is the product. At the point of purchase. That's why stock solutions don't apply in every case. And that's when we really get creative.

But before we create anything, we get to know your product. Whatever it is. Yogurt. Hair pieces, pills or pudding. Big or small. Dry, moist, viscous or fluid.

Then we may create a consumer-ready container for it from plastic. (Like one of those below) thermoformed or injection molded. Perhaps blow-molded.

We may even come up with a solution in paperboard. Or a combination of paperboard, plastic and metal.

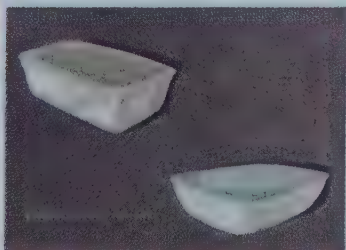
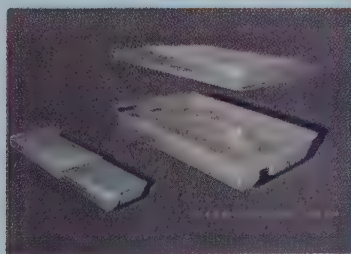
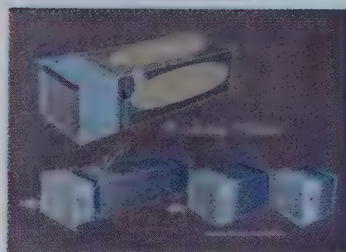
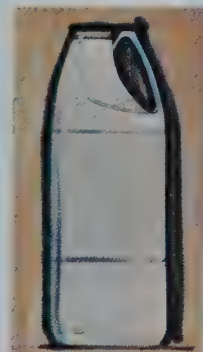
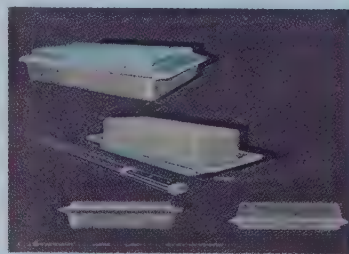
We know what it takes. So we have what it takes. Like our R & D Lab in

Kansas City where every package idea runs a gamut of tough tests. Tests that check out the compatibility of material and product. The method of making it. The job it does protecting the product. And the convenience it finally offers the consumer.

We back this up with a network of savvy machine servicemen and plants around the country.

We stay with your problem *all* the way down the line. From design, to production, to distribution.

We've got packaging on the brain. And we invite you to pick it for all it's worth.



Your Partner in Packaging.

Sealright

Packaging Subsidiary of Phillips Petroleum Company
Kansas City, Missouri 64112



don't piece your system together.....



SEMCO can give you all of the components necessary for your bulk materials handling system—for dry materials conveying, liquid handling, storage requirements, and the electrical controls for final integration. SEMCO is a **single-source supplier** for all the elements to satisfy bulk handling needs.

SEMCO's engineering staff understands bulk materials handling problems particular to all industries. And each individual problem is pragmatically approached to give you an effective, efficient system.

The total system—carefully molded to meet job requirement specifications—fits together with automated sophistication. Piece by piece, each system is designed and manufactured by SEMCO . . . for you.

For information on a complete bulk materials handling approach for your plant requirements, write

**Systems Engineering and Manufacturing Company,
P. O. Box 7634, Houston, Texas 77007.**



Designers and Manufacturers of Complete Bulk Handling Systems

Valve value.

Our new air-actuated, automatic model. Its valve seat plug assembly is designed to cushion shock load and reduce part wear. Sanitary construction throughout. Economical and easy to service. Contact the De Laval office or dealer near you for all types of sanitary stainless steel valves, pumps, fittings and tubing.

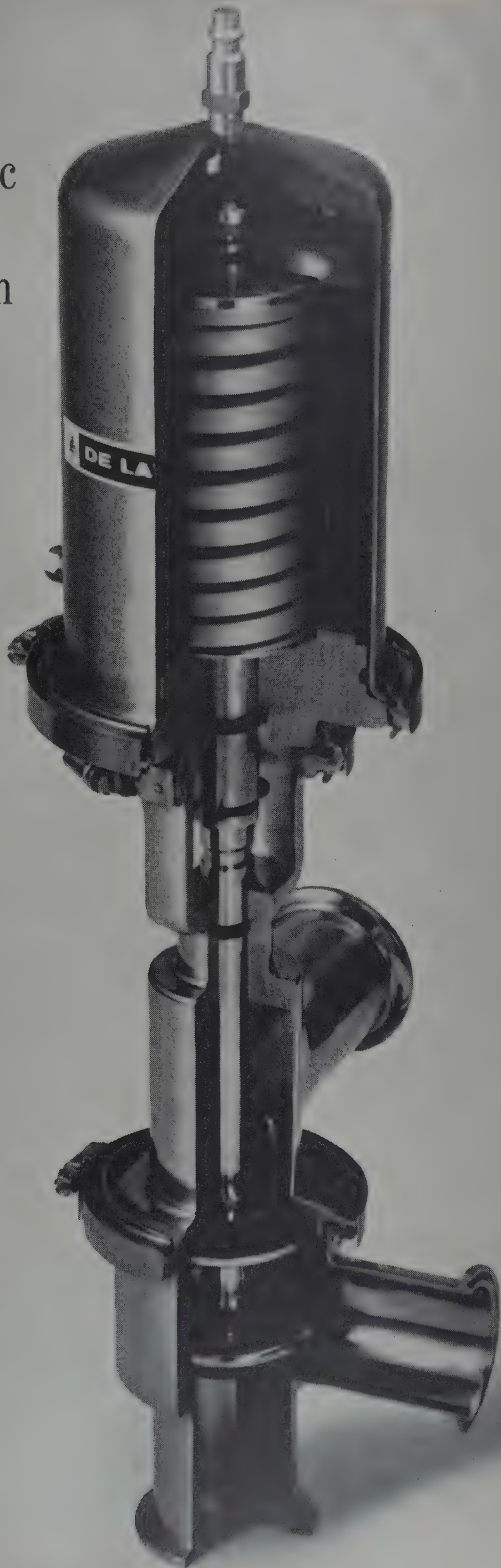
Manufactured by

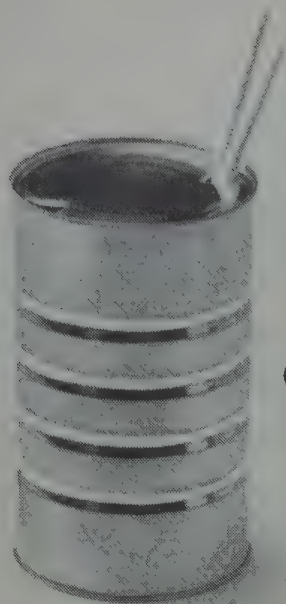


G & H PRODUCTS

The Alfa-Laval/De Laval Group

Contact The De Laval Separator Co.,
Poughkeepsie, N. Y.; Chicago, Ill.;
Burlingame, Calif. or
G & H Products Inc., Kenosha, Wisc.





**Most imitation fruit flavors
for non-carbonated
soft drinks taste like it.**

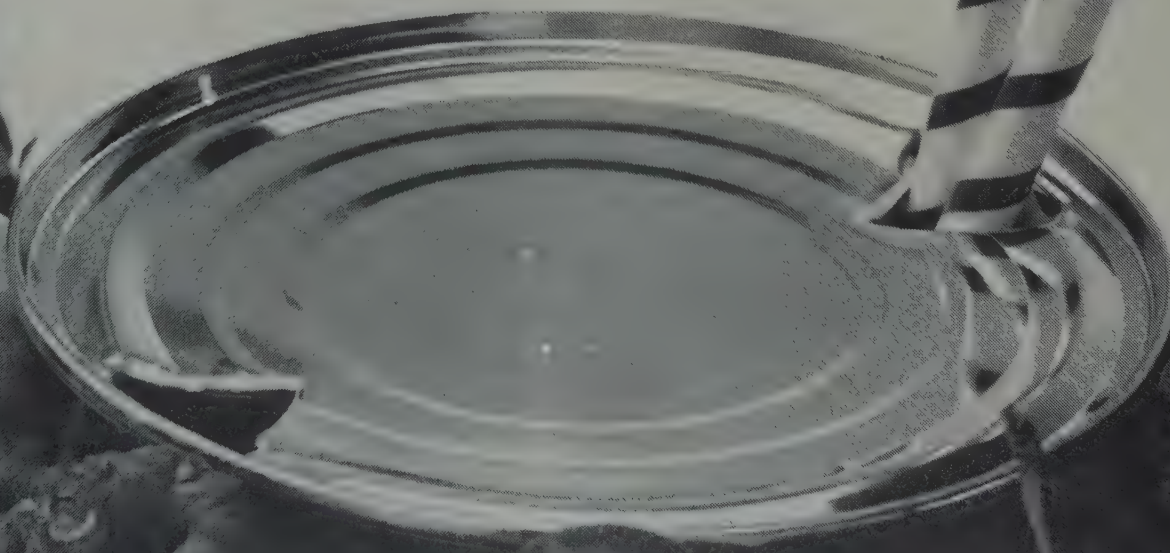
**Givaudan's tastes like the
fresh fruit at its peak of flavor!**

It's all in the formulation . . . At Givaudan, we build in flavor retention and long shelf life so that the fresh, authentic, natural taste is always there to be enjoyed.

Hard to believe? Perhaps. But it's nevertheless true. Try our imitation flavors in your non-carbonated soft drinks. That will be proof enough.

GIVAUDAN

Givaudan Corporation, 321 W. 44 St., New York, N.Y. 10036



Rejuvenates 121 Year Old Gourmet Food Business

New Wagner management expands line, makes packages appealing, and increases quality distribution to boost sales

FRANZ SERDAHLEY, Southampton, Pa., and
FRANK K. LAWLER, Editor, "FOOD ENGINEERING"

"WE SELL MORE in two good days than we did in the entire year of 1960." That is how President Ralph Starr sums up the new success achieved by John Wagner & Sons, Inc.

This skyrocket gain stems from a new line of products, new and sophisticated packaging, and

higher quality distribution. These, in turn, come from dynamic managers who understand today's challenges to manufacturers of fancy foods.

"There is no other company in America quite like it." Starting with imported cigars in 1847, Wagner built and for generations maintained the



ATTRACTIVE PACKAGE design is one key to progress at Wagner. Apothecary jar was early adopted for spices, later for some types of preserves. Wine-decanter shape is used for vinegar, oil, and flavor bottles. Cocktail mixer appropriately contains imitation liquor-flavored candies. Aerosol container is for putting dash of flavors into cocktails. Pleasantly rounded preserve jar is made from exclusive mold design.



WIDE VARIETY of package types and ideas are involved in Wagner's gourmet food line. Small tea canisters are shrink-wrapped on tray. Hard candy is packed in window cartons. Tea bags are contained in overwrap cartons. To sell Wagner quality, tea canister has message on press-in cap. And in cap's recess is packed miniature promotion brochure.



GIFT PACKAGES are big item with Wagner. These are manually assembled. Shrink wrapping will complete package.

CONVENIENCE auxiliaries—such as trays and racks for spices, preserves and flavors—increase multi-pack appeal.



REJUVENATES GOURMET FOOD BUSINESS (CONTINUED)

reputation for extra-quality products in the Philadelphia area.

"If you seek only the best, and sell only the best, you will always find people who want only the best." This philosophy of the founder still guides the company.

Expansion of the business started in 1950, when the last of John Wagner's sons retired. At that time, a group of Philadelphia business men purchased the firm and became directors. A marketing and advertising expert, Norwood Weaver, was elected president. Ralph Starr, fresh from Yale, became second in command. The Starr-Weaver team sold the cigar business and began to build an international fancy food operation. Now Wagner is an outstanding success in the fancy food field, with a big volume of gift-package business.

Sophisticated Packages

One of the initial key advances was a move to sophisticated packages. Apothecary jars were adopted for spices. Bottles with a wine-decanter shape were used for flavor extracts. Expensive looking labels were designed.

Preserves and jellies were the most significant additions to the product line. These, too, were richly packaged in apothecary containers, or in pleasantly rounded jars made from Wagner's exclusive glass mold design.

Even more important, quality is superb. Credit for that goes principally to "one of the best jelly technologists in the country," Francis Tolan, production vice-president.

Buys Best Materials

Tolan personally selects special raw materials for the preserves and jellies. Strawberry preserves, for example, are made 100% from the flavorful Marshall berry. Then Wagner puts 55% fruit 45% sugar into a maximum-flavor formula. Finally, it processes carefully in small batches to protect the gourmet taste.

Wagner cannot spot-purchase its fruit and obtain the best raw materials available. Instead it has to invest heavily at crop time in the specific

fruits needed. Then it owns the fruit and has it in storage to use as required. Suppliers always are eager to serve with favor a company that wants their best efforts, says Tolan. So Wagner obtains excellent cooperation from them.

Even though it uses the best fruit, the plant employs triple sorting before processing. Wagner simply does not mess around with quality. And this dedication to the best carries all through processing. Take strawberry preserves again.

Cooks Small Batches

This product is cooked in extremely small batches and hand-filled to keep the berries whole. Nor is a batch ever left in the kettle, or under process, during a lunch period or coffee break. That would lead to excessive heating, and the fine edge of quality would be dulled. When a breakdown halts processing, Tolan runs the batch down the drain, again because of heat damage.

It is the practice as well as the philosophy to make the best product possible. How to make a profit doing it is a separate problem. That is handled independently.

Another key to Wagner's rapid progress has been the use of competent fancy-food brokers, and more recently the establishment of the company's own domestic sales force. Management has always made it a point to protect its brokers' territories and accounts. In turn, the brokers have given generously of their wise counsel to Wagner.

Vitalized and expanded distribution put Wagner products into fine food stores across the country. Then the company bought a small plant in Hatboro, Pa., to keep pace with its sales. A sizable addition to this plant became necessary in the second year. Then a 24-acre site at Ivyland, Pa., was acquired and a larger, modern plant constructed.

In the U.S., Wagner does most of its selling directly, using only a few distributors. Internationally, the firm markets via distributors in a dozen countries. Interestingly, Japan is a good customer for seasoned rice, and Italy buys a lot of tea.

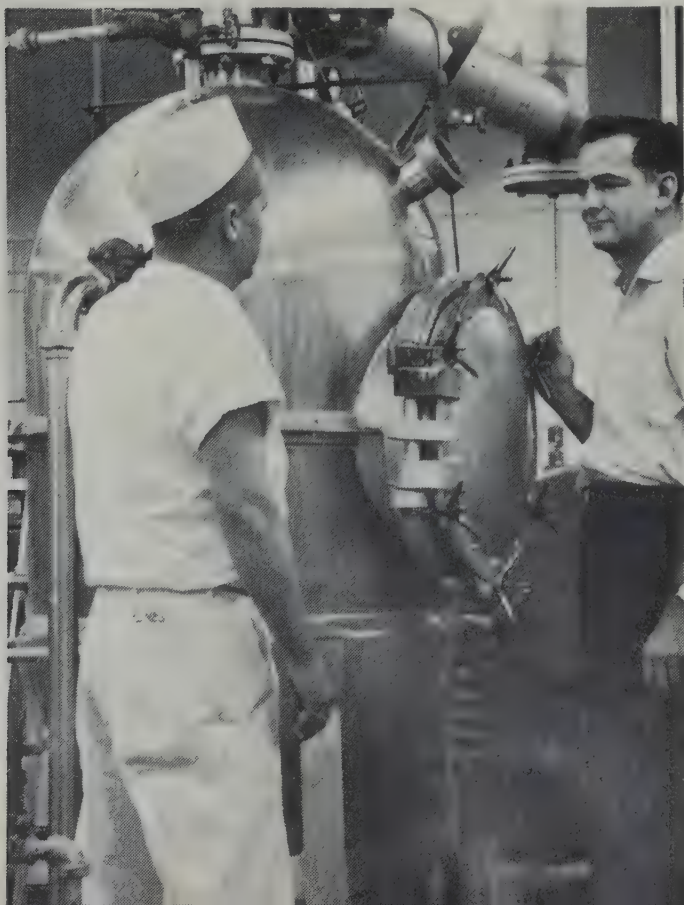
(Turn page)

REJUVENATES GOURMET FOOD BUSINESS (CONTINUED)



HEAD OF WAGNER MANAGEMENT TEAM is President Ralph Starr. He enforces policy of producing best and selling it via quality distribution channels to people who like best. He sees good future in fancy foods for firms having right knowhow.

FRANCIS TOLAN, vice-president of production (right), is rated one of top preserve and jelly technologists in the country. Processing is done in small batches for close quality control.



Wagner sells 6 preserves and 4 jellies, 150 different spices, 30 extracts, several seasoned rices, a line of teas, sundae toppings, 5 fruit toppings, vinegar and olive oil, 4 cocktail-flavored candies, 9 flavors of old fashioned candies, and hot sauces.

The spice business grows as gourmet eating increases. Seasoned rices are a fast-moving line, French onion being particularly popular. Barbeque sauce sells quite well. Liquor-flavored "candy cocktails" attract considerable attention. Flavors in this non-alcoholic line include martini, daiquiri, whiskey sour, and sloe gin fizz. A 6-oz jar retails at \$1.95.

Makes Reasonable Profit

Even with gourmet taste and sophisticated packaging appeal, Wagner finds that success in the fine food business does not come automatically. Nor is the sky the limit in profit margin. Special marketing and production knowhow enable the company to turn a profit of 4 to 6% on sales. This is a far cry from the 20% margin some visualize in the fine foods. But it is much better than the 2.5% average for conventional food manufacturers.

President Starr sees a good future in specialty foods. But the experience of Wagner and other firms demonstrates that policies and practices must be tailored to the field. Distribution is quite specialized. There have been notable failures in gourmet foods, but Wagner has avoided the mistakes that caused them.

Workers Dedicated

At Ivyland, Wagner has some 75 regular employees, and goes up to 125 for heavy June-December production period. These workers take pride in producing the best. Inspectors are so exacting that a scratch on a lid will put the product into the company store to be sold to visitors at half price. If inspectors miss faults, such as labels ever so slightly askew, the gift packers catch them. They keep production-line people on their toes.

It takes dedicated performance to keep quality at a level that commands a premium price on a repeat basis. You can't compromise on quality and succeed in the fancy-food business. Your customers are buying the kicks they get from superb taste. No kicks, no customers. (End)

DRIES EGGS

PROFITABLY

Gigantic California egg-drying facility is geared to dry locally produced eggs. Can process 15,000 cases per week and accumulate large dried-egg inventories

WILLIAM PLUMMER and J. PHILIP GEDDES

Respectively, Production Supervisor SWEP, Riverside, Calif., and Western Editor, "FOOD ENGINEERING," Los Angeles, Calif.

SOUTHWESTERN EGG PRODUCERS (SWEP) have built what is claimed to be the finest and largest egg-drying facility in the world. Two factors induced SWEP to build a new 37,000-sq ft plant in Riverside, Calif. First, analysis showed it was more profitable at certain times of the year to dry locally produced eggs than to market them in the shell. Second, there was a predicted decline in the use of frozen eggs within the food processing industry and a corresponding increase in the use of dried eggs.

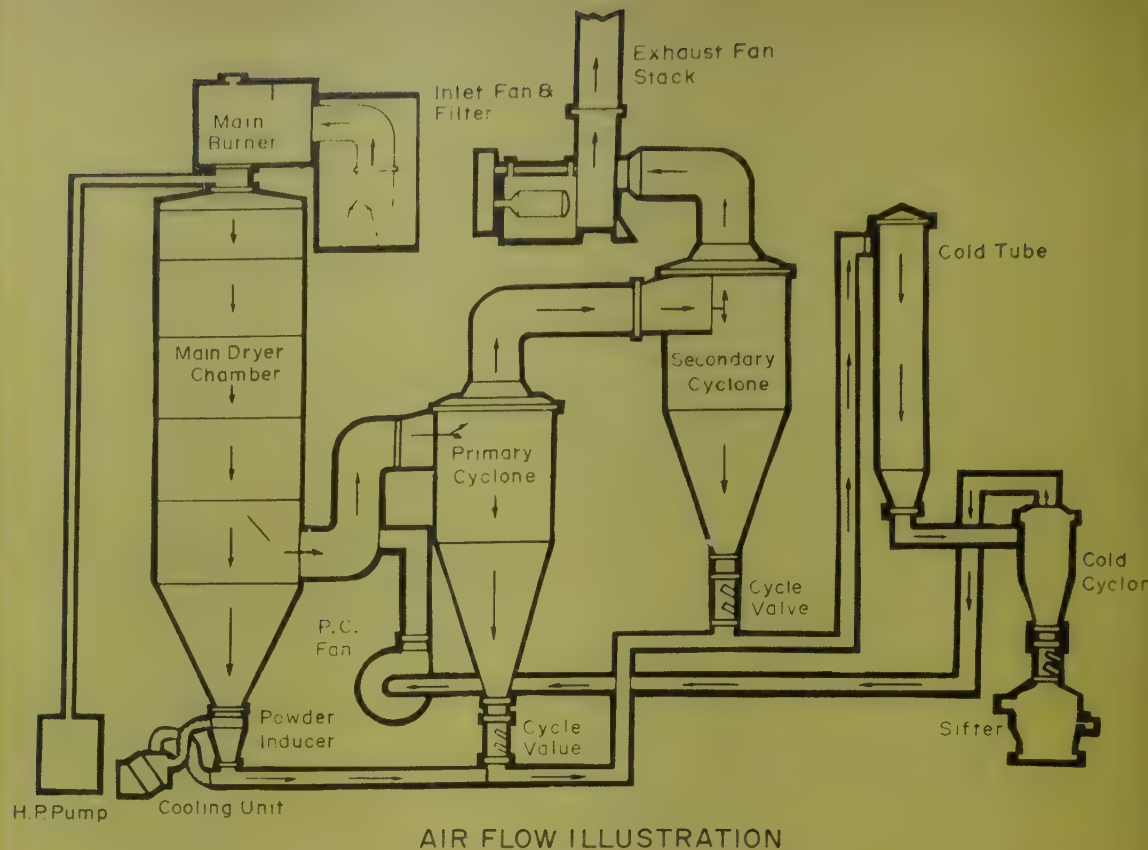
SWEP expects three advantages will accrue from owning the drying facility: The plant can remove up to 15,000 cases a week from the shell market and, in so doing, strengthen Pool I prices. Removal of a large block of eggs from the surplus market should help stabilize the price of Pool II eggs. And, in periods of very low shell prices, it will be possible for the association to accumulate large dried-egg inventories to be carried until dry prices return to a premium position.

Egg Input Operation

Liquid egg is shipped to SWEP from any one of five Southern California breaking plants in dairy-industry type tank trucks. The tanker load is pumped into any one of three 15,000-gal raw storage silos, inside the plant, where it is held at temperatures below 40F until ready to be processed. Egg whites must be desugared prior to drying in order to prevent browning of the dried product. That is accomplished by inoculating the whites being processed with a bacterial organism that converts their glucose into carbon dioxide and water. A portion of this process takes place in a 1,000-gal processing tank.

Whole egg and egg yolk are pasteurized prior to drying in a Ladish Triclover triple-tube sanitary processor with a capacity of 20,000 lb per hr. After pasteurization the liquid egg is stored in any one of five 4,000-gal silos, where it is held prior to drying. While held, any ingredients necessary for particular formulation are added.

AIR IS DRAWN through filters at rate of 25,000 cu ft/min, pushed through a 10 mill. BTU-per-hr furnace, to be heated to 420F. Hot air, blasted into main drying chamber, meets atomized liquid that's forced from nozzle. Single main chamber removes 4,000 lb water/hr. (De Laval System)



DRIES EGGS PROFITABLY (CONTINUED)

Principal design feature of this stage in processing lies in a programming panel that controls a bank of air-actuated valves. When the single operator wishes to transfer product, he simply dials in the silo from which the egg is to be moved and the silo into which it is going, pushes the proper buttons and the egg is automatically transferred. Clean-up operation is just as simple; the operator selects the tank to be cleaned, inserts the proper card into a reader in the panel, pushes the start button and the silo is rinsed, washed and post-rinsed automatically.

The Drying Process

For drying, liquid egg is conveyed from one of two 4,000-gal surge tanks to a 3,000-psi high-pressure pump that pushes it up the 45 ft to the top of the main drying chamber (14 ft diam) where it is sprayed through a single nozzle at the rate of 5,500 lb per hr.

Complete drying is accomplished in two seconds. Air is drawn through a bank of absolute filters at a rate of 25,000 cu ft per min, pushed through a 10 mill. BTU-per-hr furnace, to be heated to 420F. The hot air is blasted into the main drying chamber to meet the atomized liquid as it is forced from the nozzle. All of the drying is done in the single main chamber which can remove 4,000 lb water per hr.

A unique feature of this dryer is the fact that

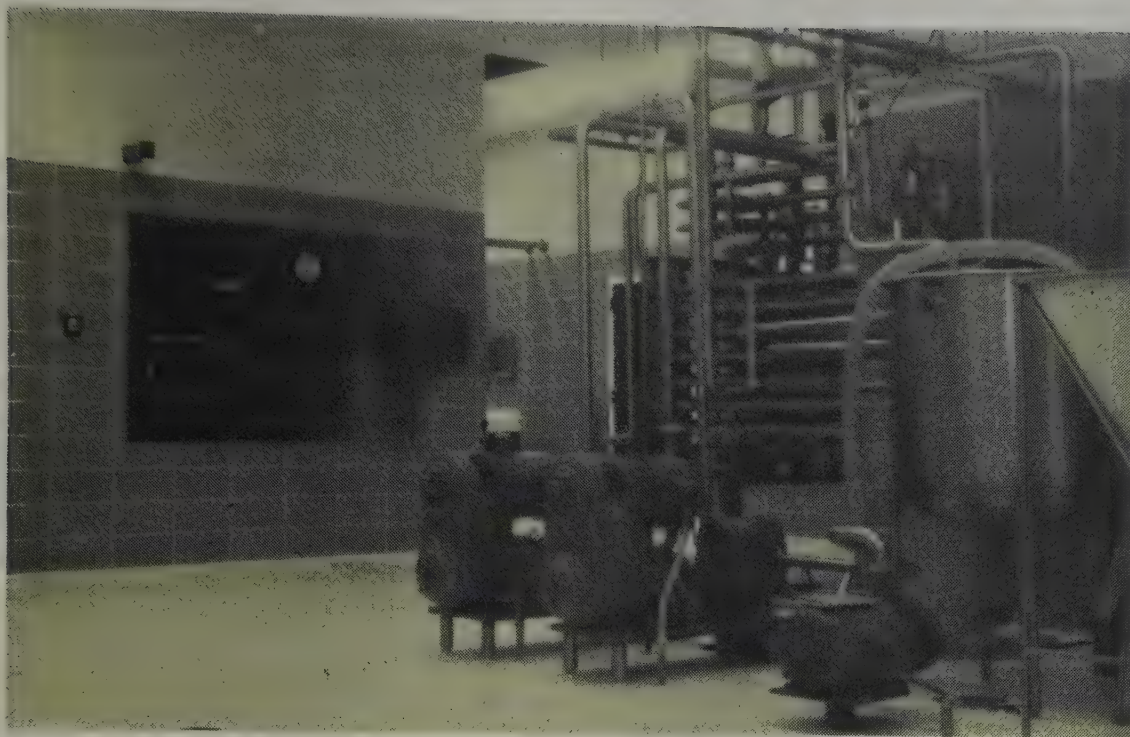
air is circulated through the chamber in such a way that the walls remain free of egg particles. This is particularly important for Salmonella and Coliform control.

After the egg has been dried, about 50% drops out at the bottom of the main chamber. The remainder is diverted into a primary collection cyclone, where another 35% drops out. Air from the first collector is diverted into a second cyclone, which separates the remaining egg particles from the air stream. Inside the collectors, a small cyclone is generated with sufficient centrifugal force to throw egg particles to the sides of the chamber where they slide to the bottom to be collected in hoppers. The air is then drawn out through another fan and exhausted into the atmosphere.

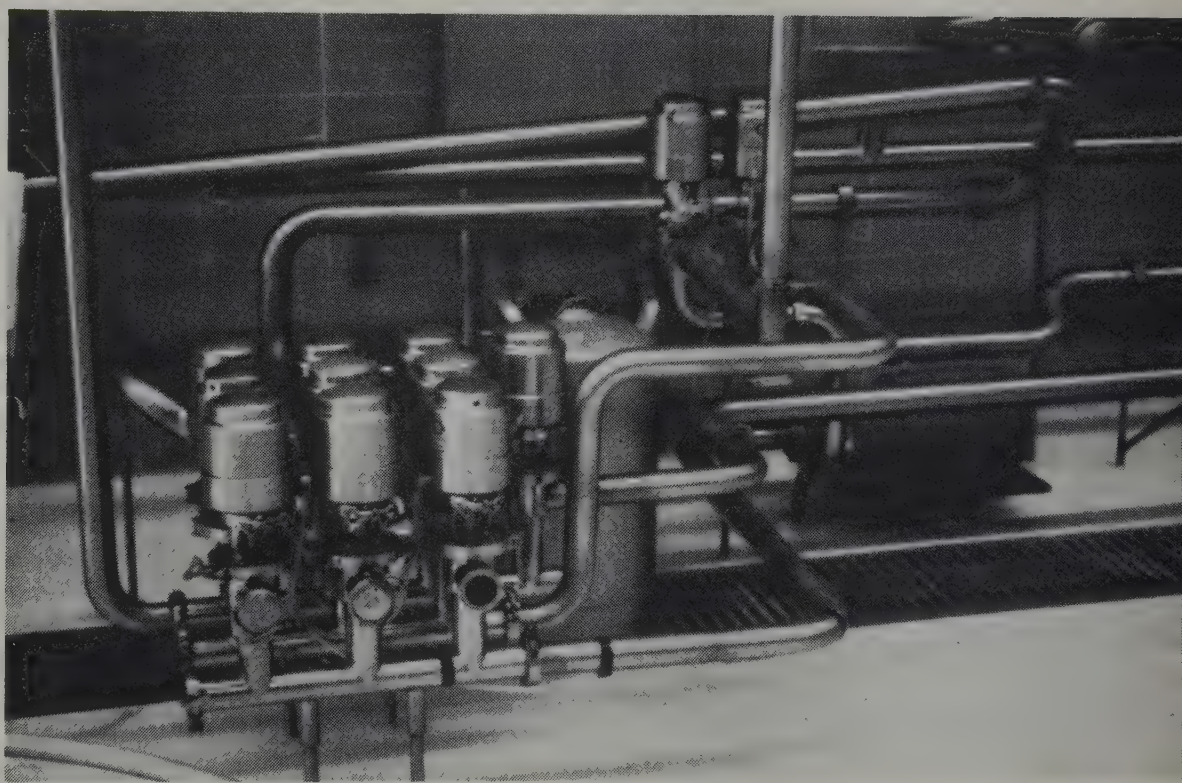
A pneumatic conveyor system picks up the egg from the bottom of each chamber, passes it through a cooling cyclone, then through a sifter and finally conveys it to the nearby packaging room. The process described is used only for drying whole egg and egg yolk. When drying albumen, because the particles are much smaller than those of yolk products, the air flow must be diverted through two filter bag houses after it leaves the first collection cyclone.

Two-in-One Dryer

It is customary in most egg-drying plants to have two separate dryers, one for albumen and



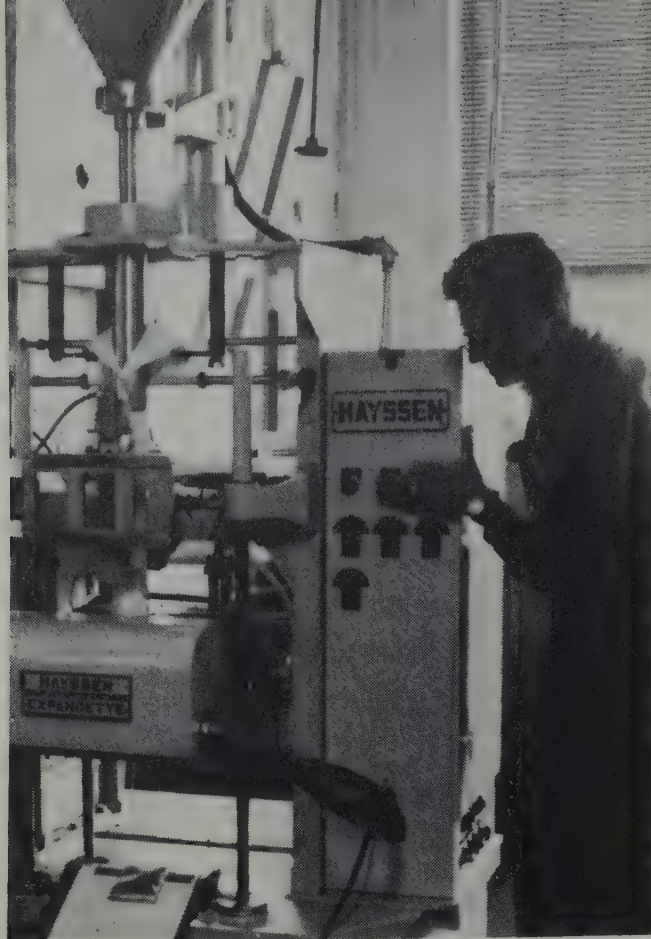
WHOLE EGG and egg yolk are pasteurized prior to drying in a Ladish Tri-Clover triple-tube sanitary processor with capacity of 20,000 lb/hr.



AIR-ACTUATED VALVES are controlled by a programming panel. To transfer product, operator dials in silo from which egg is to be moved and the silo into which it is going, pushes proper buttons for automatic transference. Clean-up is just as simple.

one for yolk products. The clean-in-place system used in the SWEP plant makes it possible to use one dryer for both. In 2½ hr, one man can completely clean the entire dryer and convert it from yellow to white operation. A single panel, requiring only one operator, controls complete operation of the dryer. After packaging, yellow products are cooled to 60F before the packaged product is moved into the warehouse. Albumen has to be heated to 145F and held at that temperature for ten days in order to kill bacteria that might remain from the desugaring operation.

The market on the West Coast is estimated to be about 10 mill. lb a year. The SWEP dryer can produce from 7 mill. to 8 mill. lb of dried egg a year, and SWEP's 12,000-sq ft warehouse can hold two months' production. Since there are no other egg dryers in the West, dried egg for use on the Coast must be shipped in at a cost of 2¢ to 4¢ per lb. SWEP anticipates that because their shipping costs will be considerably less, the net cost to the user who purchases locally dried egg will be substantially less than the imported product, giving a good edge in the local market. (End)



VERSATILE POUCH PACKAGER is fast, compact, easy to adjust and maintain. Here, it is pouch-packaging ground coffee into special pillow-pack, flow-through filter-paper bags.

GETS MORE

WHAT DO YOU DO when you roast coffee and you want to package five different coffee grinds for hotel and institutional customers?

These coffees have to be packaged into two different style packages to satisfy varied brewing methods, and filled in six different weight amounts. Moreover, you want to use only one operator to turn out this assortment of packaged, ground coffees at reasonably high production-line speeds, with minimum machine downtime for package and weight changeovers.

And all of this must be done as economically as possible.

What do you do? You'd probably do what we did at New York Tea Co., St. Paul, Minn. We installed a new Hayssen form-fill-seal machine that fits our specific needs as an institutional coffee packer. A modification of Hayssen's Expandette, designated the TRC, it takes only one girl to operate and cost us less than \$9,000. And we've been operating the machine maintenance-free for about a year.

At our plant, this single-tube unit operates at a speed of 50-60 pouches per min. Running it only six hours per day helps us to keep well ahead

of production needs. Machine is capable of handling bag sizes that are $4\frac{3}{8}$ in. wide and 3-9 in. long. Which is good for us, since we are packaging our five grinds in $1\frac{3}{4}$ -, 2-, $2\frac{1}{4}$ -, $2\frac{1}{2}$ -, $2\frac{3}{4}$ -, and 3-oz pouch sizes. It takes us only about a minute to switch over to different bag sizes. And changing from one style of pouch to another is a matter of five min.

Uses Two Pouch Materials

Moreover, this machine gives us the flexibility of putting up these grind and weight varieties into pouches formed from Saran-coated and filter-style papers. Handling heat-sealable Saran-coated paper through a vertical form-fill-seal machine isn't difficult. But running a pillow-pack, flow-through filter-style paper with fold-over heat seals is something else. The TRC machine was specially designed to handle the tricky flow-through filter paper. And it does so at the same 50-60 packages-per-min speeds.

Because the machine is compact, it fits into the scheme of things. Itself, it occupies only 36x40 in. of floor space. Since it is 102 in. high, coffee is bucket-elevated from grinder (Gump) to 600-lb

PACKAGING MILEAGE

Versatile form-fill-seal machine adjusts quickly to package a variety of coffee grinds into many styles and sizes of pouches at required speeds

WILLIS KRUMPELMANN and LA VERN ANDERSON

President and Production Manager, respectively, New York Tea Co., St. Paul, Minn.

capacity holding bins on the floor above. From here, and through selective chute tubes, the coffee is fed by gravity to auger feeder (Mateer). Weighed-out coffee is then discharged into a small cone-shaped hopper, from which it is dropped directly into the pouch-forming tube.

Machine's special auger-feed system features a revolution counter that assures $\pm 1\%$ weight accuracies. Heat-sealing is accomplished with resistance-end dies that are $\frac{1}{2}$ in. wide and have vertical serrations.

The machine is operated both electrically and pneumatically. Auger-feed system and heat-seal jaws (up-and-down travel) are motor-driven. Side sealer and open-closing movements of the heat-seal jaws are air-operated.

As for safeties, the machine is fused electrically within itself. A cutoff switch stops the machine automatically whenever there is insufficient air-line pressure.

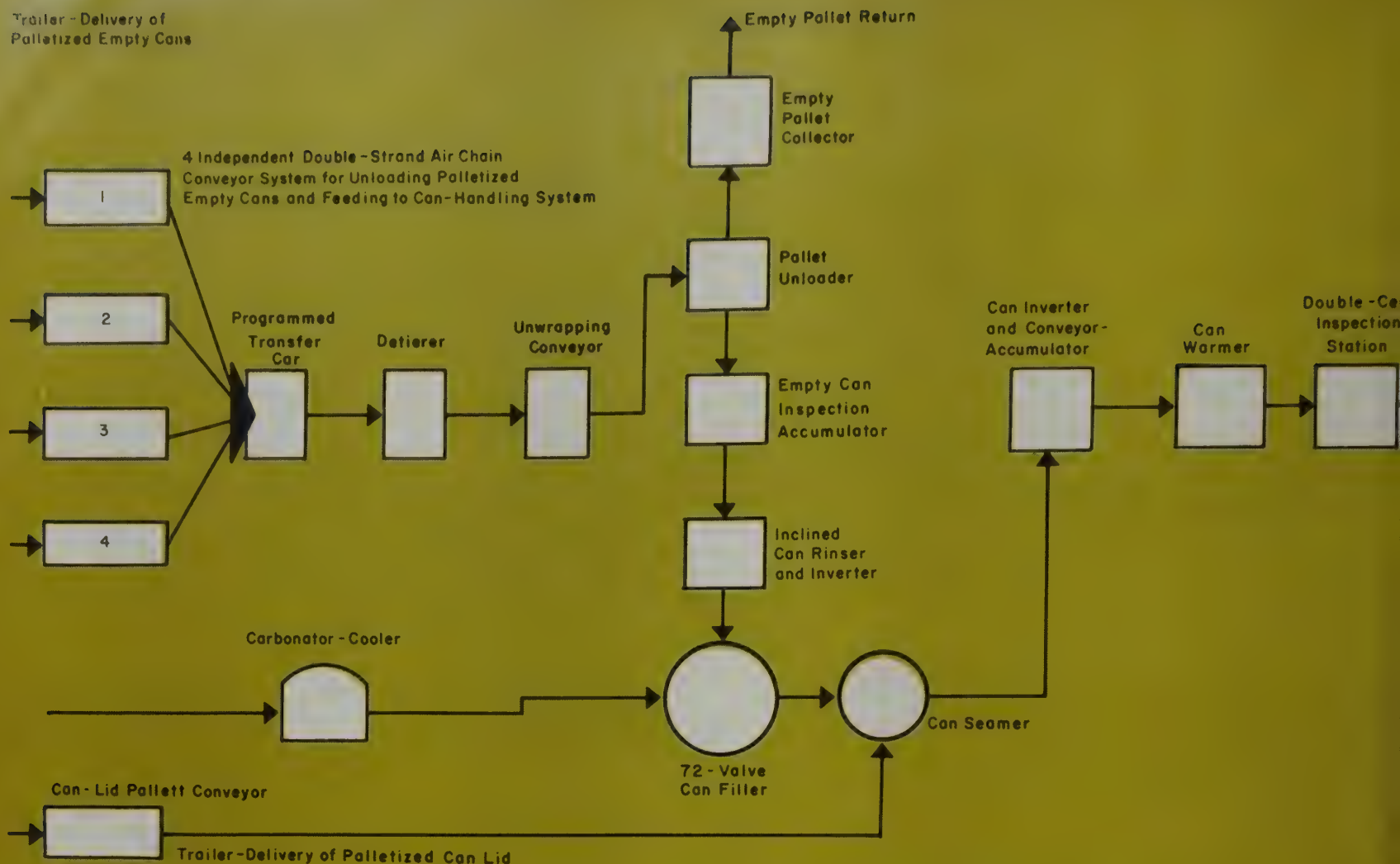
Besides the on-off pushbutton mounted on front panel, there is a selector switch for an auxiliary brake that prevents packaging material from sliding on forming tube. Other switches permit: running bags empty or full; operating machine

without forming bags (as a check); operating side and combination top-bottom seals; and, auger-feeding product into pouches in the process of being formed.

Length of pouches is adjusted from a side panel. Switch is preset for up-and-down travel distance of opening and closing heat-seal jaws to make bags of desired lengths. Through a direct-drive, the roll-fed pouch material is drawn through the traveling jaws.

Supplementing this new coffee-packaging system is another Hayssen vertical form-fill-seal machine that is similar to the TRC. Big difference is that the up-and-down stroke of heat-seal jaws is longer. As a result, this other unit is employed to make larger pouches. With it, we are pouching five different coffee grinds in nine different bag sizes. Bags are of Saran-coated kraft paper construction. Weight range is 6-18 oz.

Other difference is that an existing Gump scale is employed to net-weigh the coffee into the pouch packaging machine. Moreover, throughputs aren't as high. For example, 6-oz pouches are knocked out at a 40/min rate. With the 18-oz package, it is 28/min. (End)



Soft drink line will operate at speeds over 1,000 per min. Integrated system uses most modern automated materials handling equipment found in search of industry

ALBERT M. OLSEN

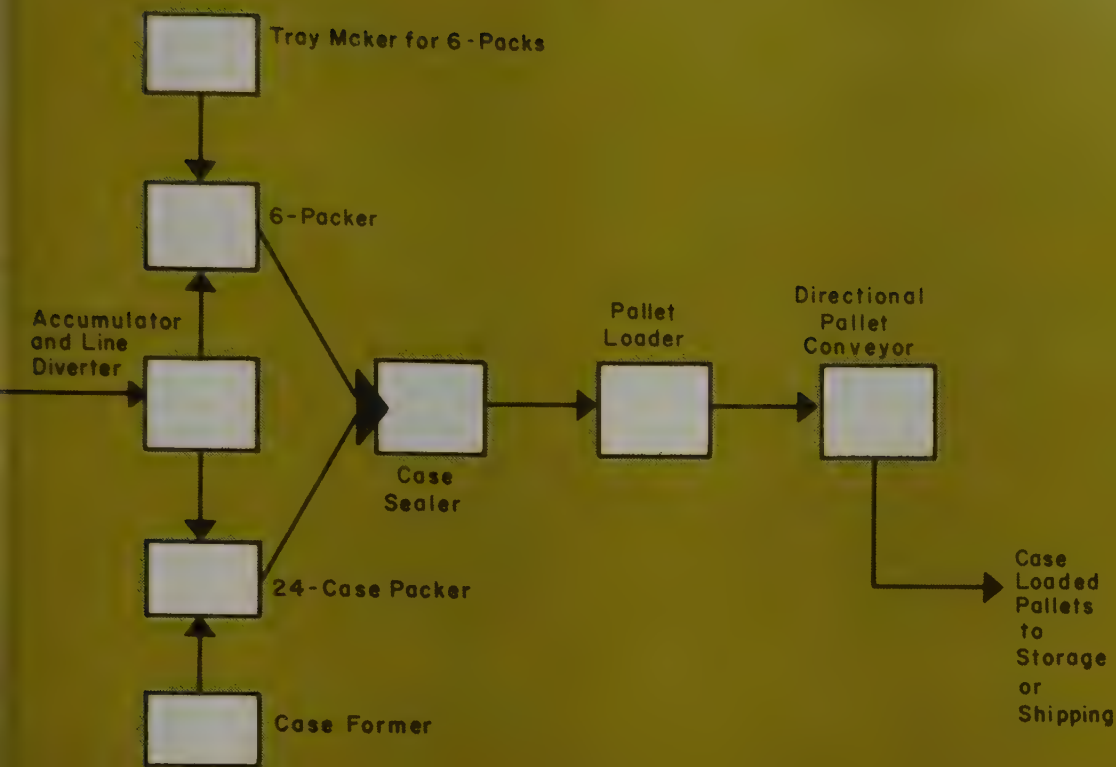
Senior Vice-President & General Production Manager,
Pepsi-Cola General Bottlers, Chicago

Can Line Runs

PEPSI-COLA GENERAL BOTTLERS, Munster, Ind., has incorporated into its new \$5-mill. bottling-canning complex the latest materials handling equipment that a one year search through modern brewery and soft drink plants in this country could find. Result is a fully integrated, very fast, soft-drink operation which will remain modern for a long time.

Can handling, filling, and packaging operations are almost straight-through. System takes only 20 min from delivery of empty cans at one end of the plant to shipment of palletized filled cases at the opposite end.

Can line currently runs at a speed of 900 cpm—8 hr per day, 5 days per week. Another shift that is being added will double throughput. And plant's canning section is large enough for future installation of another line.



FLEXIBLE CANNED BEVERAGE LINE speeds cans and lids from delivery to shipment in only 20 min. Features include automatic, motorized trailer-bed receiving of cans and lids. System unloads 16 pallets (120,960 cans) in 3-min.

at 1,000 per min

Expectations are that present line will operate at speeds over 1,000 cpm. The 72-spout filler can run at 1,050 cpm. Packaging units—6-packers and case-packers—can handle 1,300 cpm. Ultimate annual capacity will amount to 15 mill. cases—9½ mill. cans and 5½ mill. bottles.

Designed for Materials Handling

Plant is a single-story facility laid out for efficient, automatic production. Compounding of ingredients is centered in a fully automated syrup room. And inventories are automatically maintained even when the fourteen 8,000-gal, stainless, nitrogen-blanketed syrup tanks are partially filled.

There are no low ceilings, limited floor areas or low floor-loading capacities to hamper operations. Materials enter and leave in bulk. Inven-

tory is no problem. Product flow is straight into the plant and then right out at the other end. Plant has a lot of shipping capacity. However, warehouse does hold 200,000 cases of bottled, and 300,000 cases of canned beverages because the facility services the wide Chicago area.

Present manufacturing building covers 128,000 sq ft of a 20 acre site. Production area can expand to 200,000 sq ft. Separate building for offices, advertising, shop, vending, fleet repair, and storage occupies 41,000 sq ft.

Plant's 24-ft ceiling permits 1970 installation of an automatic pallet storage and retrieval system. Coupled with it will be an automated truck loader. That way, 20 pallet loads of various beverages will be directly transferred from storage into specially designed delivery trucks with motorized beds.

(Turn page)



TOP
OVER 1-MILL. CAN LIDS stacked on pallets are automatically unloaded from trailer's motorized bed onto pallet conveyor for direct transfer to can seamer.

ABOVE
HEIGHT-OF-FILL inspector uses gamma rays and Geiger counter to check level of contents. Unit activates pneumatic rejection of low-level cans.

. . . 1,000 PER MIN (CONTINUED)

Pushbuttons Control Handling

Trailer load of 120,960 empty cans is unloaded automatically onto one of four double-pallet handling conveyor systems (Alvey Conveyor). Trailer's motorized bed transfers 16 pallet loads of empty cans in 3 min onto the system. The four side-by-side systems can hold almost a ½ mill. cans in temporary storage.

Adjacent to four conveyor systems is another system which receives pallet loads of can lids



SHIPPER CASES are automatically formed, filled with 24 cans per case, and sealed. They then proceed to palletizer.

for one-time handling and temporary storage. System receives 1 mill. lids at a time.

Programmed transfer car calls for and transports each double-pallet load of empty cans from one of the four temporary storage conveyors to a detiering unit. At the unwrapping conveyor, an operator snips wire bands holding the pallet cap in place.

Pallet unloader (American Can) depalletizes empty cans at rate exceeding 1,500 cpm. Through

a series of photoeyes and limit switches, the unit calls for a full pallet as soon as it discharges an empty one. Also, unit removes each tier-separating paperboard sheet which is then automatically stored for reuse. Conveyor carries each emptied pallet to a storage location for return to the can-making plant.

Cans travel past an inspection station into an incline rinser (Barker Mfg.). Unit rinses the inside, it drains and uprights (easy-open-end is on bottom) the cans at speeds of 1,200 cpm.

The 72-valve rotary filler (Meyer) fills 16-oz and 12-oz cans. Mixer-cooler-carbonator (Mojonnier) prepares beverages for filler. A 12-head can seamer (Continental Can) is close behind the filler. Unit seams bottom lids at speeds to 1,300 cpm. Operator feeds lids to seamer by means of a scissor-jack table. He uses foot control to raise or lower table so that he does not waste time bending over to pick up a tube of can lids.

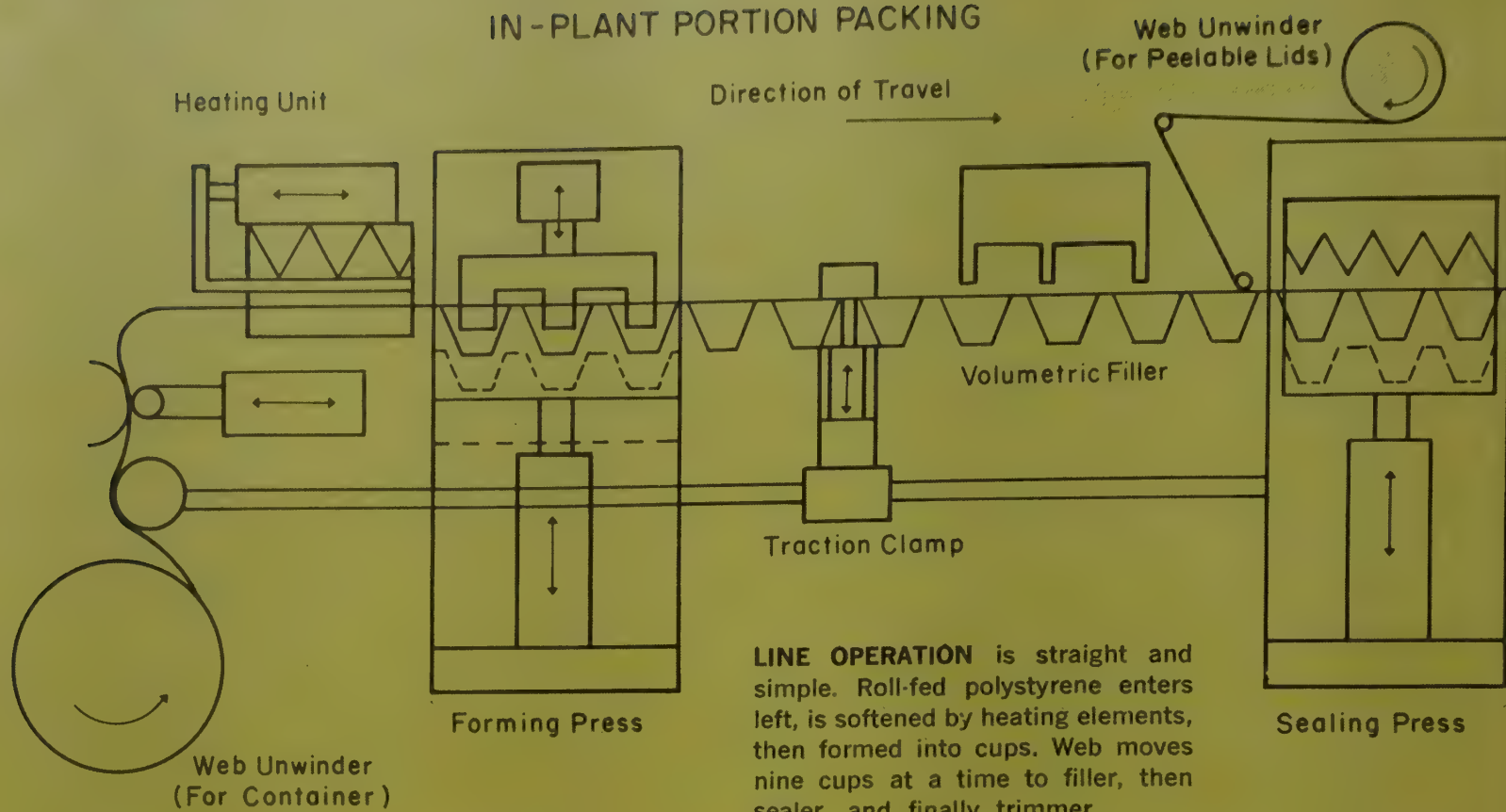
Cans are inverted and pass through a can warmer. Unit raises temperature of beverages from 40F to 68F. That prevents accumulation of condensate on cans, and increases can's internal pressure which provides a test for adequacy of seaming operations. From warmer, flow splits into two, 600-cpm conveyor lines. Cans pass a height of fill inspector (Industrial Nucleonics' AccuRays). Here gamma rays and Geiger counter check fill of each moving can.

Full cans enter a 1,200-cpm accumulating table and converge. Cans are directed to one of two packaging lines. One is for packaging 24 cans into a shipper. The other is for putting up 6-packs which are packed four to a corrugated tray.

The 6-packer (Mead Packaging) operates at speeds to 2,000 cpm. Unit discharges 6-packs onto a diverter which forms a double line. A tray maker (Huntington Industries) automatically produces trays from corrugated boards. And a packer accumulates and loads four 6-packs into a tray that is then conveyed to an automatic palletizer.

On the shipper line, balancers split two lines of filled cans into four lines. Cases are formed from specially cut corrugated blanks for end-flap gluing and folding back of top flap into open-case position. Packer accepts four lines of cans and loads 24 cans into shipper. Cases are then hot-melt sealed and sent to pallet loader which makes 10 cases-per-layer and 10 layers-per-pallet. Palletizer has speeds just over 2,200 cases per hr. (End)

IN-PLANT PORTION PACKING



LINE OPERATION is straight and simple. Roll-fed polystyrene enters left, is softened by heating elements, then formed into cups. Web moves nine cups at a time to filler, then sealer, and finally trimmer.

MAKES SINGLE-SERVERS

DAVID WILLIAMS, Plant Manager, Bancroft Dairy Co., Madison, Wis.

A BRIGHT VARIATION in portion packs for coffee cream has been introduced by Bancroft Dairy Co., Madison, Wis. It is a gleaming white, thin-wall thermoformed polystyrene cup with a built-in pouring spout designed to avoid spilling during use.

The 1½-in. high lightweight plastic cup is ribbed for strength and tapers from a 1⅞-in. diam at the top to a 1-in. diam at the bottom. And laminated, red-and-white cover, carrying all product data, features a pull tab.

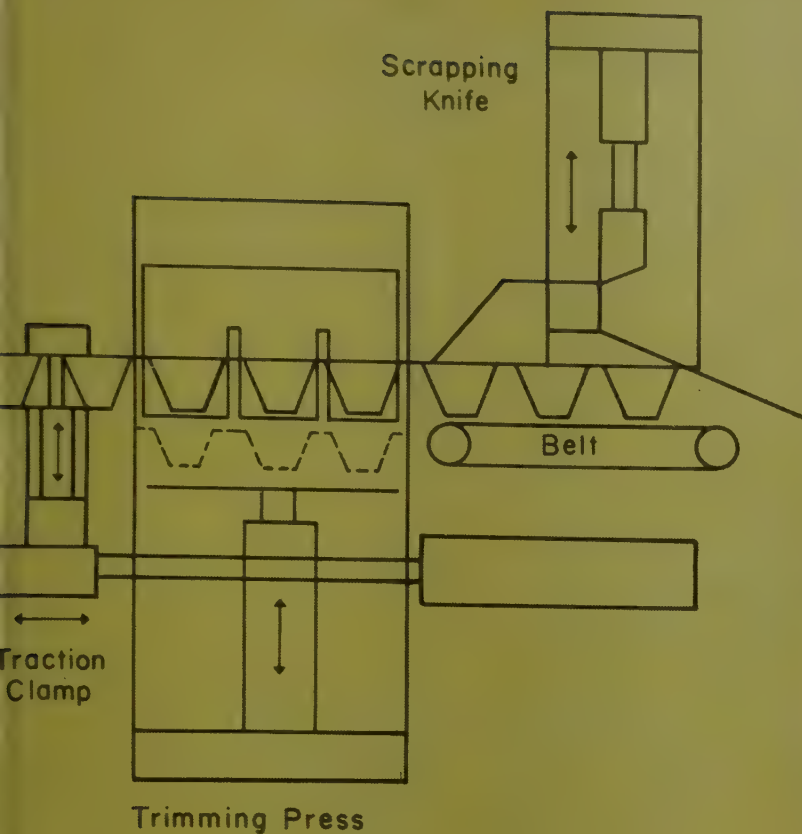
Made From Roll Stock

Thermoformed in-plant from roll stock, this package offers all the economics and quality control of self-manufacture. It is gang form-fill-sealed as a 3x3 pattern of nine cups by a horizontal machine (Anderson's Formseal).

The cups are made by feeding thin-gage, 6¼-in. wide polystyrene (American Can) into Form-

seal's forming station through action of an unwinder. The web proceeds through a 6-element electrically operated, temperature-controlled heater located between web unwinder and forming press. Web is protected during temporary stoppages by a water-cooled screen. When machine is down, air-actuated screen travels between web and heating elements to prevent overheating of web.

Heated to about 400F, web continues to forming press where, nine at a time, the cup-like containers are formed from the heat-softened web. The press closes to stop movement of web, then pre-forming punches travel downward to start forming operations. During punches' downward movement, injected compressed air forces softened web against walls of the nine molds arranged in a 3x3 pattern. After forming times out, punches retract, press opens, and web advances.



PASTEURIZED CREAM is filled into cups from 3-gal hopper at left, then web is covered by roll-fed laminate lidding material (paper/foil/polyethylene). Photoeye in sealing unit provides accurate registered sealing of nine containers at once.

GANG STYLE

Modified form-fill-seal machine produces nine plastic portion-control containers of coffee cream at a time, using roll stock for both rigid cup and peelable lid

At the next station, $\frac{1}{4} \times \frac{1}{2}$ -in. slots are punched out of web and alongside formed containers. When paired, these slots form four $\frac{1}{2} \times \frac{1}{2}$ -in. slots for the 3x3 pattern of containers. In so doing, the four large slots allow sufficient space for pull-tab portion of lidding material to be heat-sealed to containers' lips.

In filling, flow of coffee cream from pasteurizer (Cherry-Burrell's Unitherm) to filler's level-controlled 3-gal hopper is monitored through a timing pump with variable-speed drive. Pump is rated at about 30 gph. Pasteurized to 285F, cream is simultaneously filled into nine plastic cups. Opening and closing of air-actuated valves is controlled by an electric timer for $\frac{1}{2}$ -oz fills.

Lid-sealing is next. Mounted above sealing press is a spring-loaded unwinder for the roll of lidding material—a paper/foil/polyethylene laminate (American Can). Web is advanced under constant tension to sealing press. As the peelable

lidding material advances, it moves past a photoeye for accurate registered sealing to containers. Containers are then heat-sealed gang fashion.

Web of filled-sealed containers now travels to trimming press. Here, trimmer separates 3x3 patterns of filled-sealed plastic cups from one another. It also trims web around the 3x3 pattern.

Take-away conveyor carries filled-sealed containers to carton-packing station. They are packed 144 containers per carton. As required, four container-filled cartons are then paper-taped together for shipment.

Much of Bancroft's success with the portion-control package for its coffee cream is due to the cups' prestige appeal, quality upgrading, and easy-pouring feature. Extended refrigeration shelf-life—beyond 30 days—also makes the new package a winner. Bancroft also portion-packs $\frac{1}{2}$ -oz Half & Half, in addition to its pint and quart packs. (End)

HOW TO GET MOST OUT OF MILK SOLIDS

They're modified and blended in many ways to build in functional properties that improve your products and processes

JOHN V. ZIEMBA, Senior Associate Editor, "FOOD ENGINEERING," Chicago

MORE THAN EVER, milk dryers are increasingly diversifying their line of milk solids (whole, nonfat, and buttermilk). Because of this, the growing specialized needs of the food industry are being better satisfied.

Food manufacturers, of course, want milk solids for the nutritional properties they impart to processed foods. The solids contain proteins that contribute essential amino acids. And they provide dietary mineral salts (calcium and phosphates), lactose and vitamins.

But users also want milk solids "tailored" to (1) function better in product formulations, (2) assist and simplify process conditions, (3) become adaptable in new processes like continuous dough-making, and (4) produce better quality and longer shelf-life products.

Milk solids, especially proteins and butterfat, have been modified by heat, enzyme or chemical agents. Result is that either the use of milk solids

has been broadened or that one or more of its primary functions intensified.

Milk proteins are heat- or acid-modified. Butterfat is enzyme-modified. Milk solids are even "moist-heat modified." They're also blended to further extend their functional and nutritional properties.

Modifying the Proteins

Milk proteins differ in composition and properties. So they can be modified in different ways to provide varying levels of fat or water retention capabilities in certain foods. Water-binding properties of proteins are important, too, in the manufacture and storage of milk solids.

Basically, heat treatments—whether they're high, medium or low—modify certain milk proteins. Those particularly heat-denatured are the whey-protein fraction (lactalbumin and lactoglobulin). Casein isn't heat-denatured, but is

MULTIPLE FUNCTIONS— emulsification, bodying and moisture absorption—have been tailored into solids blend made up from fresh fluid, whey, skim milk, and buttermilk.



acid- or enzyme-modified.

When milk proteins are heat-modified, their molecular salt linkages and hydrogen bonds are broken up. The proteins then unfold and uncoil from their specific molecular structures and change into more random configurations. While in this rearranged condition, they tend to refold and recoil. But they don't revert to their original molecular structure.

Such protein rearranging results in solubility and absorption changes in milk solids.

Effects of Treatments

They differ as to where in the process (before, during and after concentrating), the degree (low, high, super, ultra or combinations), and the duration (seconds or minutes) to which milks or blends are subjected to heat.

Generally, fluid milks (whole, skim, buttermilk, and blends) get a low-heat (160F-165F with

short holds) and high-heat (180F+ with long holds) treatments prior to concentrating and then spray drying. Super- and ultra-high heat treatments are carried out at 185F and 200F, respectively. Condensing or evaporating heat usually ranges between 100F and 150F.

Real low-temperature nonfat milk solids are processed from condensed skim, from which water is evaporated at 85F and with heating medium never exceeding 108F. Protein damage doesn't take place at this greatly reduced temperature, irrespective of the transit time of milk through an evaporator.

Trouble with prolonged heat treatments is that the milk proteins are "poached" to give an unwanted "boney" flavor in dried milks.

Low-heat treated products are suitable for making cottage cheese, buttermilk, whips or ice cream mixes as well as for fortifying skim. In some cases, cottage cheese yields are up 10%.

TIPS ON BASIC TYPES OF MILK SOLIDS

Nonfat milk solids are available in regular and instantized forms—and with different heat treatments. The instantized, low-heat, cold-water dispersible product is for fortifying fluid milk products with additional solids, and for use where re-constituting equipment isn't available.

The non-instantized, low-heat type goes into formulating products (fluid milks, dressings, margarine, cottage cheese) where its physical properties and skim-milk flavor are needed.

The superheat product is completely protein-denatured. It's for ice cream, sausage products, baked goods. In yeast-raised products, for example, it protects the dough's gluten strength through doughmaking and baking processes.

Whole milk solids are available with 26.0, 28.0 and 28.5% butterfats. They provide a source of concentrated butterfat and nonfat solids for products requiring them. Typical uses for them are

HOW TO GET MOST OUT OF MILK SOLIDS (CONTINUED)

Superheating milk to 185F prior to spray drying imparts viscosity-increasing properties to products. Superheated nonfat milk solids in an ice cream mix tend to cut down on the use of stabilizers. Moreover, ice creams have a good texture and body.

To further illustrate the versatility of processing, manufacturers of milk solids subject different fluid milks to high heat-treatments before condensing, and superheating after condensing and before drying. This combination heat-treating technique lets milk dryers process solids with uniform moisture-absorption properties throughout the year and despite seasonal raw-milk variations.

In general, high-treatment maximizes the extent to which the whey-protein fraction is modified. However, a certain degree of protein-denaturing takes place during superheating and spray drying. Milk dryers have even adopted special tricks when spray drying milk concentrates to add an extra bit of heat-denaturing to milk solids. That is especially true when producing special superheat powders for bakers and sausage makers.

For the most part, milk solids are spray-dried rather than roller-dried. Latter method is reportedly more expensive. It's not as easily controllable. And overall potential of heat damage by

roller drying is greater than by spray drying.

All of these different heat treatments give users a wide choice as to types of solids.

Who Wants Them, How?

Different food processors specify milk solids with different heat treatments for different reasons. For example, cottage cheese makers want low-heat solids to get the full benefit of milk protein's coagulating properties. They want these solids to retain their curd-forming ability and not have them altered. They also use them to fortify skim milk and thereby increase cottage cheese yields.

Minimum heat treatment also results in milk solids with less "cooked" flavors. So dairies specify their use in standardizing skim milk and whole milk for bottling. Same is true for those producing ice cream, buttermilk, chocolate dairy drinks, cultured sour cream, and cottage cheese dressings. Even packagers of instantized nonfat milk solids for home makers want them low-heat treated.

Other processors want more extensively heat-treated milk solids, especially because of their high water- and fat-absorption capacities. Improvements in the quality of baked goods are directly or indirectly attributed to high heating effects upon the whey-protein fraction of nonfat

in cream soups, toppings (fudge), ice cream mixes, other mixes, bakery products, chocolate, and chocolate coatings.

Sweet buttermilk solids are recommended for foods where butterfat and other fatty components contribute flavor-enhancing properties. They're for baked goods, frozen desserts, certain mixes, ice cream.

High-acid buttermilk solids are derived from a blend of sweet cream buttermilk with cultured whey and lactic acid-treat-

ed casein. While they have the same level of butterfat, lecithin and protein as their sweet buttermilk counterpart, they also contribute the cultured flavor and aroma typical of fermented or cultured buttermilk products.

In addition to serving as a food flavoring ingredient, these solids also go into mixes (cake, waffle, pancake), specialty breads (pumpnickel and sour rye), and cakes (devil's food and other heavy chocolate types).

ANALYSIS OF DIFFERENT MILK SOLIDS

Types of Solids	Butterfat (%)	Water (%)	Protein (%)	Lactose (%)	Minerals (%)
Nonfat milk	00.75	03.00	37.55	50.50	08.20
Whole milk (26%)	26.20	02.25	26.40	39.15	06.00
Whole milk (28%)	28.20	02.00	25.80	38.00	06.00
Sweet cream buttermilk	05.00	03.50	35.90	47.80	07.80
High-acid buttermilk	06.00	04.20	35.80	40.10	08.40
Whey (roller-dried)	01.00	04.80	12.80	72.40	09.00
Cream	71.00	00.70	11.00	14.50	02.80

milk solids. Doughs build up their water- and fat-absorption properties. Since they retain liquids better, these solids offer built-in anti-staling properties.

What's more, dough mixing and makeup operations are more uniform. Mixing tolerance is extended. Doughs withstand more abuse, yet bake out to uniform quality products. Sticky doughs aren't a problem. And loaf volumes increase.

Doughnut fryers want even higher heated (superheated) nonfat milk solids for controlled fat and moisture absorption. Hot frying fat "hits" the dough, seals its surface to minimize fat penetration and greasiness. Yet, the dough absorbs enough liquid to increase the doughnut's volume and moistness.

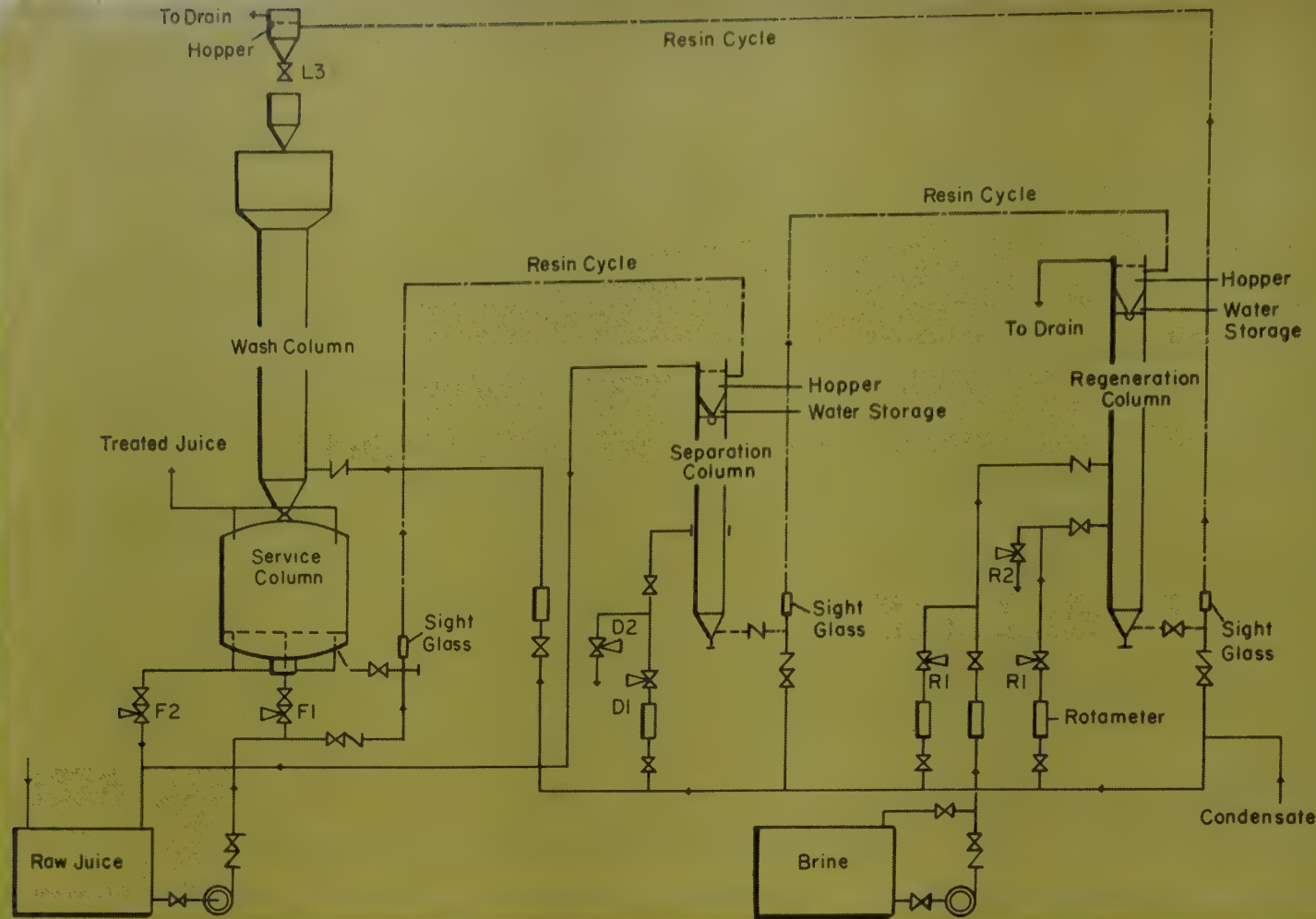
These high-heat solids are also formulated into foods where specific, quantitative water additions are essential for product performance. Pre-

pared bakery mixes are a case in point.

Sausage makers also want these "high-heats" to soak up fats in their formulations. This way, their products become less greasy. They also serve as binders.

Other processors want their milk solids high-heat treated for reasons other than for rearranging proteins. Their milk solids must be high heat-treated to kill thermophilic spore-forming organisms they contain and, thus, check product spoilage. Milk dryers are complying by offering solids whose thermophile counts meet the standards of the National Canners Assn. With these low-thermophile solids, packers are now trouble-free processing products like cream soups, sauces (for vegetables), canned puddings, sterilized dairy drinks, and refrigerated bakery goods.

Part II covering additional properties and uses of milk solids will appear in the January FE.—The Editors



ION EXCHANGE occurs in service column, spent resin discharges continuously, and resin from wash column

replaces it. Exhausted resin moves to separation column, to regeneration column, and to wash column.

ION EXCHANGE GOES CONTINUOUS

Shows multiple benefits in demineralizing juice. Is broadly applicable to liquids. Concept useful in decolorizing, too

DAVID L. de ARYAN, Vice-President and General Manager,
Degremont-Cottrell, Inc., Bound Brook, N.J.

CONTINUOUS ion exchange has lived up to its promise during its first season in France.

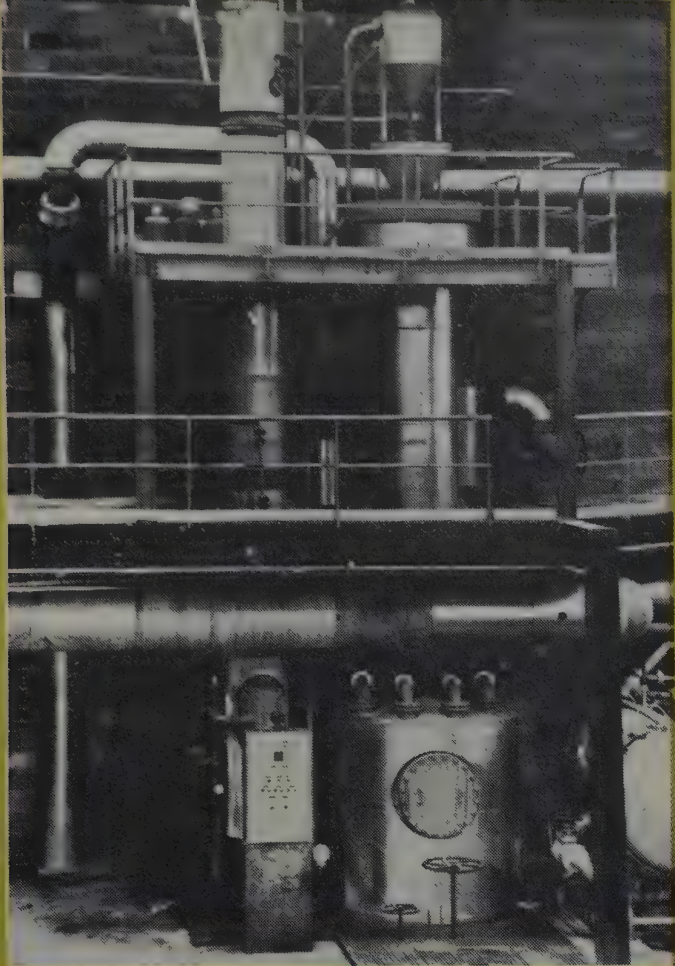
Initial investment and operating cost are lower than for the conventional cyclic operation. Monitoring and adaptability to computer control are simplified. Salt consumption is 40% less than for fixed-bed equipment. Resin loss has been extremely low. And chemical composition of treated liquids does not vary.

In addition to specific applications—such as the treatment of can syrup mixtures, sugar beet juices, and sugar in other liquors—the process is promising generally for demineralization of water for any food processing consumption.

The low cost of the continuous process makes possible the economical treatment of brackish water containing several thousand ppm of salts. This is so because resin requirements increase more slowly than the rate of salinity increases.

It is also possible to adapt the techniques of this continuous process to odor removal or absorption on activated carbon granules, and for filtration on granular materials.

The Degremont-Cottrell Continuous Counter-current Ion Exchange process was installed by Degremont S.A., Paris, to delime beet juice following the second carbonization, prior to evaporation. Nine refinery orders have been placed



DELIMING PLANT for beet sugar juice stands 36 ft high occupies floor area of only 12x18 ft.

with Degremont, and one U.S. project is in the engineering stage. World-wide there are some 45 plants in operation, or about to start up, employing the Degremont-Cottrell process.

Here's How It Works

In the Vic-Sur-Aisne installation, the calcium-sodium ion exchange is affected in the service column. Juice flows upward through an automatic valve and a flowmeter, out through piping equipped with a regulatory valve. There is a countercurrent movement of resin downward in the column.

Spent resin is discharged continuously, and every 15 min a valve opens automatically for about 30 sec to reduce column pressure. This causes a ball valve at the base of the wash column to open and discharge new resin into the top of the service column.

The exhausted resin moves to the separation sweetening-off column, where a new charge is introduced every 3-5 min by automatic valving. In this column sugar juice is separated from the resin and returned to the process stream. Exhausted resin is then transferred to the regeneration column, again once every 3-5 min.

The exhausted resin moves downward in this column, countercurrent to an upward flow of

ammoniated brine solution supplied by a dosing pump to a distributor in the column. The exhausted brine goes through a valve and flowmeter to a drain.

The regenerated resin is transferred to the wash column, from which it flows to the service column by gravity. Wash water flow is countercurrent, upward. An automatic valve on the metering hopper above the wash column regulates the speed of circulation of resin in the entire closed cycle. This valve operates for about 30 sec, about once every 15 min. The exact timing is adjusted automatically in accordance with variations in the composition of the raw sugar juice. The rate of regenerant injection is also adjusted accordingly.

Discharge from the wash column into the service column, replacing exhausted resin discharged from the bottom, completes the resin cycle.

Performance Data

The installation at Vic-Sur-Aisne treats raw sugar juice at an average rate of 660 gpm, and is capable of 800 gpm. The resin is Duolite C-21-H1. Design was based on a raw juice hardness of 180 ppm as CaCO_3 . Design operating temperature is 90F.

The installed system, including auxiliary pumps and tanks for brine and juice, occupies a floor area of 12x18 ft and is 36 ft high.

Total dissolved solids in the beet sugar is in the range of 2,500 ppm; hardness is about 180 ppm.

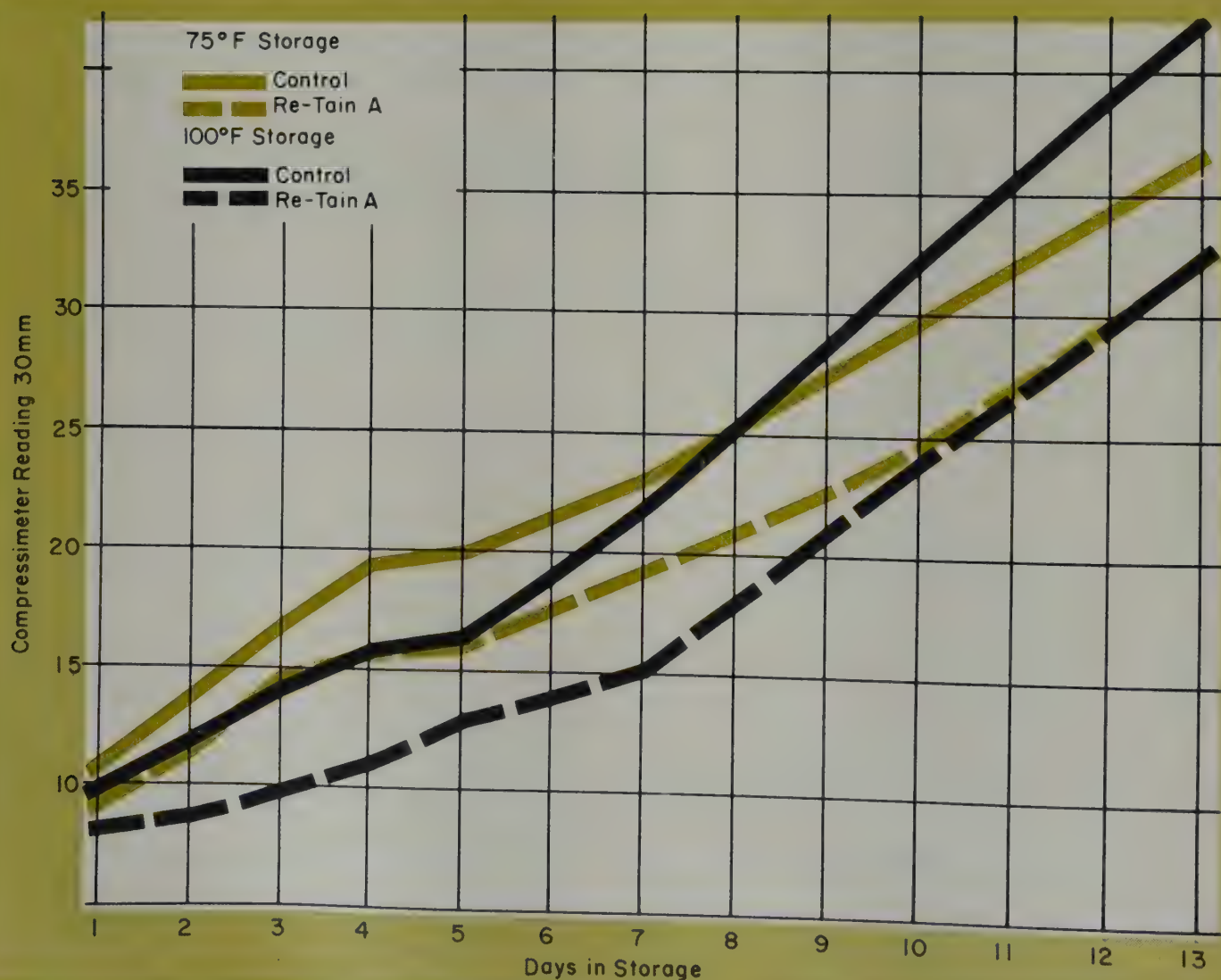
Leakage being a function of total dissolved solids, a conventional unit would need a regeneration level in the range of 460% of stoichiometric. In contrast, continuous ion exchange needs only 240 to 250%. With these salt regeneration levels, the deliming obtained is in the range of 6 to 8 ppm in the effluent.

Based on the treatment of 100 million gal of juice during the 1967-68 winter season, resin loss was expected to be 25 cu ft. Less than half that loss was actually experienced. Through rigid control, dilution associated with sweetening-off and sweetening-on has been less than 1%, and sugar loss is nil.

(End)

KEEPS IT FRESH LONGER

JOHN V. ZIEMBA, Senior Associate Editor, "FOOD ENGINEERING," Chicago



Enzyme treatment of bakery products retards staling, improves texture, eases slicing, offers economies, and suggests new products

TIME-DELAYED REACTIONS from heat-stable bacterial enzyme (alpha-amylase) splits starch in bakery and related products. But only after baking heat causes starch to gelatinize.

Usage level is important. Low level prevents firming for white bread and rolls without affecting other quality characteristics. At high usage levels, the A-amylase's action is extensive and destroys crumb structure resulting in a liquefied product.

Derived by fermentation from *Bacillus subtilis*, the enzyme is available in powder form and a particle size compatible with flour. Corn starch standardizes potency of the amylase. Enzyme is GRAS and has approval as an optional ingredient in FDA's bread standards. Wallerstein Co., div., Travenol Laboratories, Inc., Morton Grove, Ill., manufactures bacterial A-amylase and J. R. Short Milling Co., Chicago, sells the enzyme.

Work at Baking Temperature

A-amylases from *B. subtilis*, unlike those from fungal and malt sources, exhibit heat resistance to 170F and higher when splitting gelatinized starch.

Two preparations of enzyme are available. Called "Re-Tain A" and "Fresh-N," the latter is more potent in amylase activity. And because of this difference, each is used for different types of baked goods.

Bread and soft roll production require levels of 1½ to 5 oz "Re-Tain A" per 100 lb of flour. Commercial bakery tests indicate that there is no need for adjusting enzyme content for specific lots of flour. And amylase usage does not require changes in formulations or baking procedures.

For breads, bakers add heat-stable amylase at

the dough stage of sponge-dough method and, of course, to the dough in the straight-dough method. Bakers can add the enzyme into the continuous process either at the brew or at the dough-development stage with other dry ingredients.

Commercial cake mixes can also benefit from A-amylase. Based on dry mix weight, 0.15-0.25% will enhance Devil's food cake. For white cake, amount to use is 0.2-0.4% and for yellow 0.4-0.75%.

"Fresh-N" preparation is suggested for other type baked goods. Sweet dough products can use 0.08-0.15% of A-amylase based on flour weight. Recommended level for coffee rings is 0.30-0.60%; for fruit cakes 1-2%; for brownies about 1%.

With cakes, best enzyme distribution is by mixing powdered amylase with water and adding to batter. With water-free formulas, it is best to blend the amylase with the eggs.

Heat stable A-amylase splits the gelatinized starch into dextrans during baking. These smaller starch fractions (dextrans) contribute to maintenance of fresh-baked quality. Moisture-retention capabilities of starch's breakdown products provide baked goods with superior slicing and crumb characteristics.

Develops New Bakery Item

Addition of relatively large amounts of heat-stable A-amylase to conventional-type cake batters produces, upon baking, a new pie-like confection, or other novel baked goods.

Using Wallerstein patented method (U.S. No. 3,026,205), heat destroys A-amylase in batter at surface and adjacent to baking pan. That forms a crust. But during baking and subsequent cooling, there is sufficient heat-stable A-amylase active in the interior. Result is that enzyme alters interior crumb structure into a pudding-like mass which simulates a pie filling.

Possibly, pie bakers may need only a single batter that's similar to one used for cakes. Pie-like confection requires less leavening agent than is customary. Bakers can use usual cake-making procedure for preparing batter with A-amylase.

(End)

COMPRESSIMETER DATA substantiates that bacterial A-amylase treated bread retains its fresh-baked quality. Results show that over 13-day storage period, A-amylase-treated bread has slower rate of firming. And indications are that enzyme treatment of 3 oz/100-lb-flour adds 2 to 3 days shelf-life.

Dried Fruits have **LOW** **MICROBIAL** **COUNTS**

USDA STUDIES on the microbial quality of processed dried fruits have revealed that apples and other cut fruits have low populations of bacteria, yeasts, and molds. The Dried Fruit Assn. requested and aided the studies.

Samples of products (totaling 293) were collected at processing plants. Analyses for bacteria, yeasts, and molds were made and the counts tabulated. Special effort was made to determine the presence of Salmonellae and coliform bacteria.

Table 1 summarizes data obtained in the survey. Table 2 shows survival time of Salmonellae typhimurium inoculated onto the dried fruits.

Microbial Counts of Cut Fruits

Because of the relatively high concentration (300-500 ppm) of sulfur dioxide, the low pH (3.3-3.5), and the heat treatment given apples during processing and drying, the counts for that fruit were understandably low. Other cut fruits (apricots, nectarines, peaches, pears) also had low counts due primarily to their sulfur dioxide content and low pH. All counts on cut fruits were below 800 bacteria per gram except one, which was 11,000.

Figs and Prunes

Figs (pH 4.5-5.0) receive a series of heat treatments that can destroy any microbial-flora and a sorbic acid treatment capable of controlling any yeast or mold present. Thus, the counts were low as expected. Likewise, prunes (pH 3.5-4.0) would be expected to have relatively low counts. This was the case for unpitted prunes except for one unexplained high bacterial count. However, pitted prunes had higher counts.

Raisins and Dates

Raisins receive no treatment that would lower microbial counts during processing except washing and cleaning. However, the low pH of raisins (3.5) does not allow growth of bacteria and

USDA study shows low counts of bacteria, yeasts, and molds in processed dried fruits.

No Salmonellae or coliform bacteria present

A. DOUGLAS KING, JR.

RONALD K. FIELDS

FRANK P. BOYLE

USDA, Western Utilization Research and Development Div., Albany, Calif.

destroys some bacteria. The highest counts were found on candy-coated raisins, oiled raisins, and one package of normally processed raisins.

On the average, the counts on dates were highest of all the fruit examined. Because dates are frequently rehydrated, the moisture can be high enough for a yeast fermentation. Also, the pH of dates (5.5-6.0) is the highest of the fruits tested and allows both bacteria and fungi to grow. Thus, if a microbial population is present on dates, it can survive or grow, depending on the product's moisture condition.

Presence of Salmonellae and Coliforms

Analyses for Salmonellae and coliform bacteria

Table 1. Counts per Gram of Fruit of Aerobic Bacteria, Yeasts, and Molds on Processed Dried Fruits

	Apples	Other Cut Fruits	Dates	Figs	Prunes	Raisins
No. samples analyzed	15	15	29	15	18	50
Bacteria						
Average	274	835	6,487	662	3,718	2,542
Median	10	53	320	30	0	1,500
90% of Counts less than	730	757	21,000	93	4,600	8,200
Range	0-2,600	0-11,000	0-50,000	0-7,700	0-50,000	0-60,000
Yeasts and molds						
Average	261	23	2,478	17	851	3,934
Median	8	0	90	0	0	390
90% of Counts less than	730	52	720	110	6,000	20,000
Range	0-1,500	0-210	0-30,000	0-120	0-7,100	0-30,000

Table 2. Survival of *Salmonellae typhimurium* Inoculated onto Dried Fruits and Stored at Room Temperature

	Days of Storage			
	0	7	22	50
Apples ^a	+	—	—	
Cut fruit ^b	+	—	—	
Dates	+	+	+	+
Figs	+	+	—	
Prunes	+	+	—	
Raisins	+	+	+	—

Original population 100,000 per gram fruit
+ = Survivors; — = No survivors detected

^a 83 ppm SO₂
^b 870 ppm SO₂

were conducted on the samples collected at processing plants. Neither *Salmonellae* nor coliform bacteria were found in any of the samples.

A series of tests were set up to determine how long inoculated *Salmonellae* would survive on dried fruit. Survival was short on sulfured fruit (apples and cut fruit) and fruit treated with sorbate (figs and prunes). However, on raisins, which have a waxy dry surface, the survival was somewhat longer. On dates the survival time was at least 50 days.

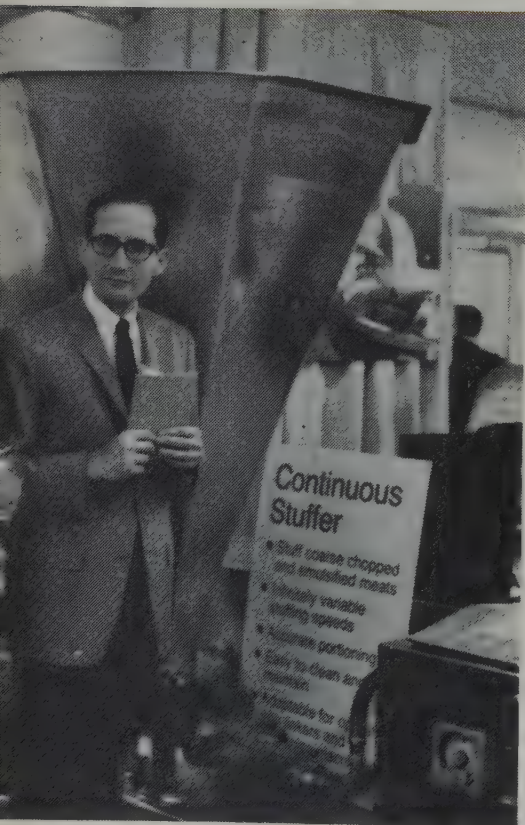
General Considerations

The composition, physical properties, and handling of dried fruits explain the kinds of micro-

flora that will be present. Because the products have a reduced amount of water, they have high concentrations of sugar. The sugar causes high osmotic pressure, which stops growth of most microorganisms. Microbial spoilage does not occur in dried fruit having less than 18-25% moisture, and the variance is due chiefly to sugar content. Among the microorganisms, bacteria require the most free water, then yeasts, and finally molds can grow in higher concentrations of sugars.

The acidity of some fruits also reduces the possibility of growth of microorganisms. For instance, most bacteria do not grow below pH 4.0-4.5. At lower pH values (higher acidity) both yeasts and molds are capable of growth. (End)

NEW FOR PROCESSING



◀ **VARIABLE-SPEED STUFFER** controlled by hydraulic motor, offers speeds up to 80 lb/min. Vacuum stuffer assures accurate weight measurements up to 5 lb ($\pm 1\%$) through rpm counts of twin screw feed and hydraulic control.—Koch Supplies Inc., Kansas City, Mo. (387)

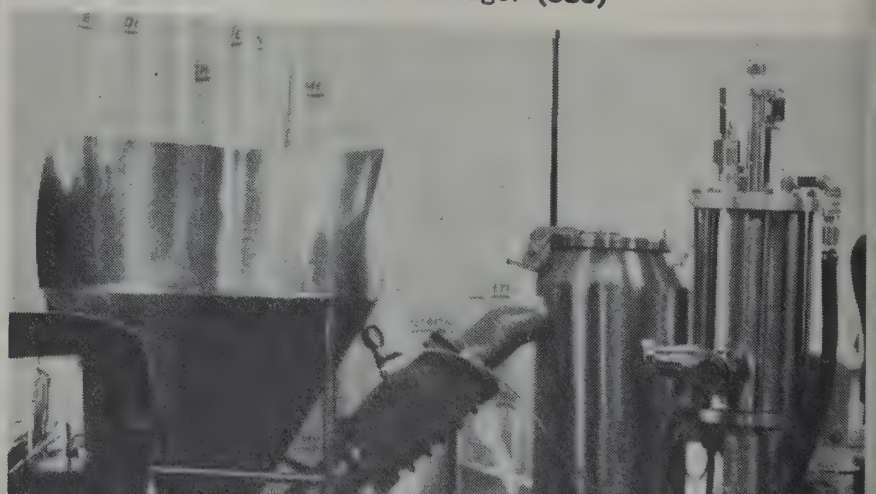
PORTABLE VACUUM STUFFER operates at capacities up to 5,200 lb/hr. Hoppered product is continuously stuffed without smearing. Rugged drive and impeller system permits handling stiff emulsions. Hence, unit stuffs at lowest emulsion stress.—Griffith Laboratories, Chicago. (389)



EASY TO CLEAN STUFFER has stainless steel contact surfaces, is thumbscrew-dismantled. Unique rotary lobes ensure smooth, even product flow with minimum alteration of particle structure.—Foodtech Limited, London, England. (388)



▼ **CONTINUOUS VACUUMIZER** removes entrapped air from fine- and coarse-cut meats. Yields firmer, denser products to assure more product per foot of casing. Uniformity of weight attributed to vacuumized stuffing increases slicing yields by reducing costly rework of product.—Allbright-Nell Co., Div. of Chemetron Corp., Chicago. (385)



**Latest in equipment for size reduction,
tenderizing, cleaning, deaerating,
stuffing, and fat analysis seen at AMI show**



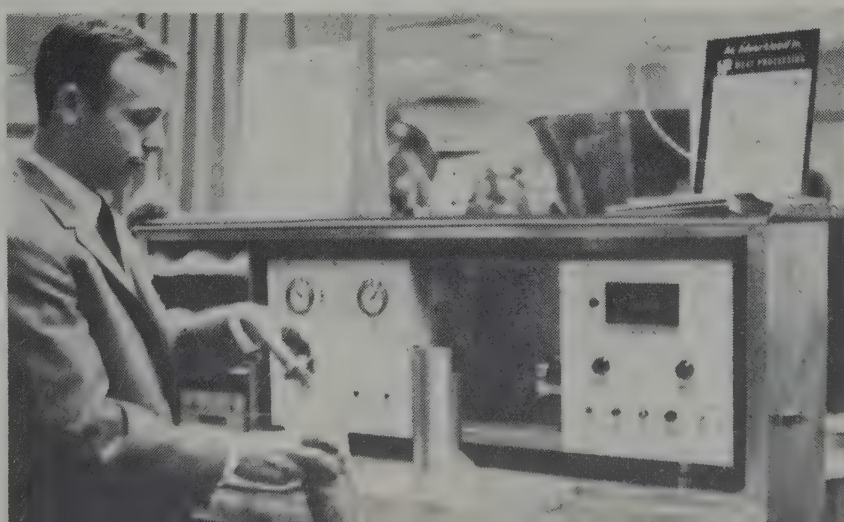
◀ **DEAERATOR** is engineered for continuous flow processing at rates up to 175 lb/min. Feeds thin film of product into bowl that rotates at 2,400 rpm. Centrifugal force removes layer of product to outer rim of bowl to remove air. Unit also pumps deaerated product to next machine.—The Katridg Pak Co., Davenport, Ia. (386)

COMPACT SIZE-REDUCER performs first grind, meat blend and final grind operations on 200 lb of product in 7 min. It tumbles and folds meat without smearing or crushing fibers. Can be in-place cleaned or easily taken apart for cleaning.—Hollymatic Corp., Park Forest, Ill. (380) ▶



◀ **AUTOMATED NON-CHEMICAL MEAT TENDERIZER** features dial-style control of tenderness. Single stroke tenderizes a 180-sq in. area. Employs 16 $\frac{3}{8}$ -in. wide stainless feed belt and stainless saber blades. Adjustable for irregular shaped meats. Can be easily cleaned.—Jaccard Corp., Buffalo, N.Y. (381)

DIGITAL FAT CONTROLLER makes in-process, direct readout of fat content of meats—hamburger to 2-lb chunks—to 0.1% accuracy in 1 min.—Koch Supplies, Inc., Kansas City, Mo. (384) ▼



NEW FOR PROCESSING (CONTINUED)

OTHER MACHINES SHOWN

HIGH-SPEED STUFFER has built-in hopper and vacuum system, variable speeds up to 10,000 lb/hr. Electrohydraulic device supplies portions in 3½-oz to 80 oz. range at speeds up to 150 min. Hydraulic unit has neither clutches nor brakes. Safety valve protects against overloads.— Benckiser Inc., Fort Lee, N.J. (390)

EASY TO CLEAN continuous dicer operates at capacities from 500-1,400 lb/hr. Cuts products into squares or rectangular shapes by action of cross cut and circular knives at right angles to each other. Suitable for soft or fragile products that can't be generally diced without excessive waste or damage. — Urschel Laboratories, Inc., Valparaiso, Ind. (382)

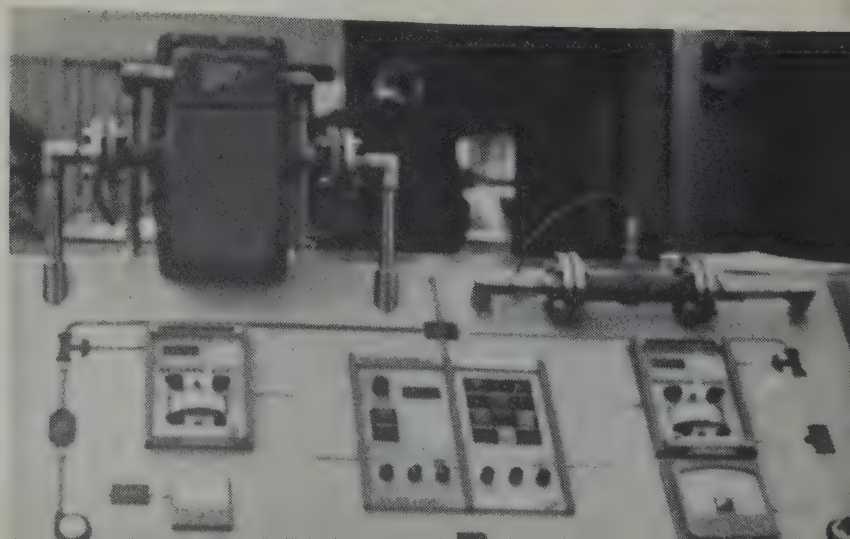
CONTINUOUS DICER handles 6 tons of fresh, frozen or cooked product per hr. Double sickle knives ensure smooth, balanced running. Variable-speed gear box permits variety of cube dimensions (6-24mm). — Displayer: Packers Development Corp., Rochester, N. H. (383)

Advanced control, metering, blending, filtering, and CIP units exhibited at Brewing Industries Exposition, Detroit

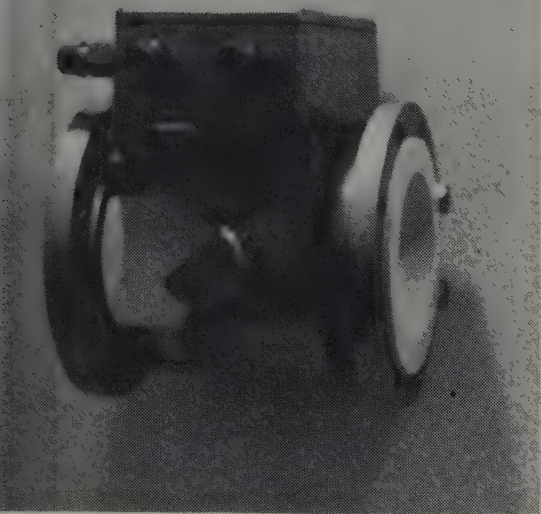


PROCESS CONTROL system of simple "plug-in" style can regulate up to 40 devices (valves, pumps, motors) through 32 programmed steps, using 16 sensing units. Here system simulates sterilizing filter operation. — Millipore Corp., Bedford, Mass. (372)

DIGITAL IN-LINE BLENDING system measures flows in two-streams by Rotameter and magnetic flowmeter. Pulse from one meter is transmitted to ratio setter, other to digital control station. One stream is proportionately controlled through digital station to $\pm 0.5\%$ accuracy.— Fischer & Porter Co., Warminster, Pa. (373)



**New
SHORT FORM
CHARACTERIZED
COIL DESIGN**

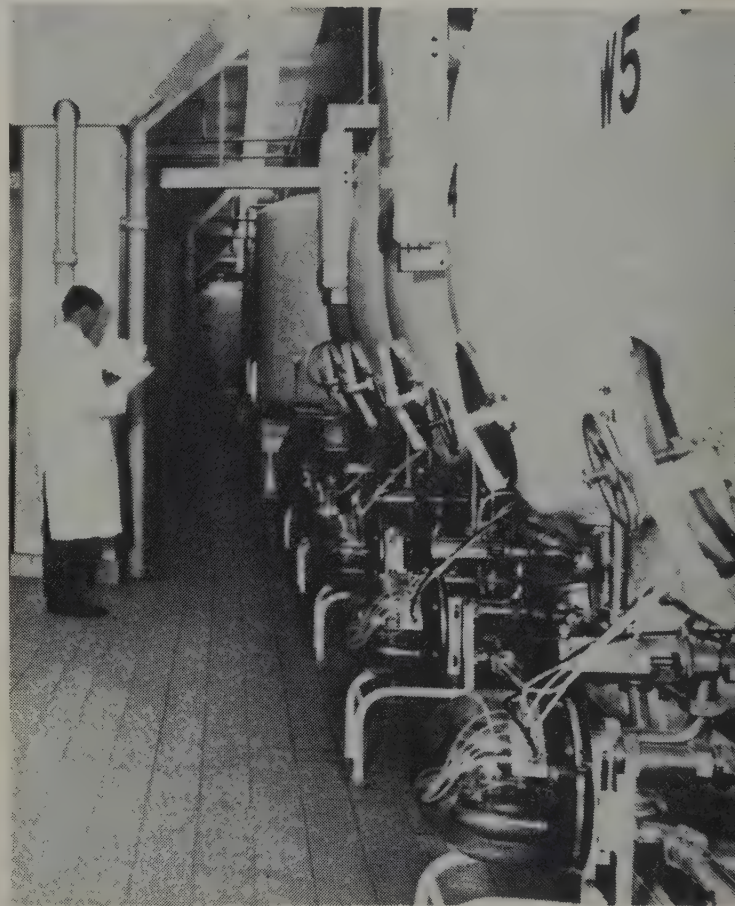


MAGNETIC FLOWMETER with characterized coil is significantly reduced in size and weight. Reliability has been improved, cost reduced. Practical limitation of pipe size is no longer problem.—Fischer & Porter Co., Warminster, Pa. (374)



LARGEST FILTER has 150 plates. Of stainless steel, it is adaptable for sterilizing or polishing filtration. It is rated at 500 bbl/hr of beer, with up to 20,000 bbl before taking down. Unit is hydraulically opened and closed.—Seitz-Werke GmbH., 6550 Bad Kreuznach, West Germany. (376)

FLO-SPLITTERS (inside domes on stands) isolate cleaning circuits from product lines during CIPing. They prevent possible contamination of product with cleaning solutions.—APV Co., Ltd., Buffalo, N.Y. (375)



OTHER EQUIPMENT

REVOLVING Jet tank washer provides slow travel and high-pressure for fast cleaning and complete flooding washdown. Most contaminants are removed with clear water before detergent recirculation, saving detergent. Cleans tank up to 38 ft long.—C. E. Howard Corp., South Gate, Calif. (377)

AUTOMATIC METERING system liquefies and dispenses hop extract into wort kettles. Centrifugal pump circulates hot wort from kettle through heat-exchange plate to liquefy extract, which is injected into return wort stream.—J. I. Haas, Inc., Washington, D.C. (378)

MICROSCOPIC SLIDE technique for rapid determination of viable and dead yeast cells in beer rapidly shortens present 2-day growth period. It informs analyst of presence of live yeast in stabilized beer within 30 min after packaging. Method involves successively staining test-filtered beer with Clayton yellow and acriflavine hydrochloride, flushing with McIlvanie's buffer and making transparent with xylene. On microscopic examination live yeast cells fluoresce to a bright yellow-orange. Dead ones fluoresce more faintly, with a greenish color.—Millipore Corp., Bedford, Mass. (379)

Test yourself on the benefits of CMC

Your Du Pont man can help you get a perfect score.

Compared to natural gums, Sodium Carboxymethylcellulose from Du Pont has two important advantages: 1. *Consistent properties*, so you always get the same results. 2. *The best combination of properties*, which Du Pont can control precisely to meet your needs.

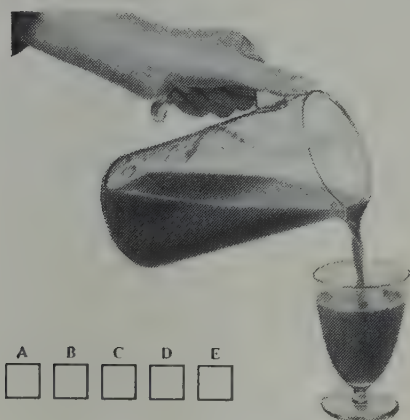
In manufacturing Sodium CMC, Du Pont works with five variables:

A	B	C	D	E
degree of polymerization	degree of carboxymethyl substitution	uniformity of carboxymethyl substitution	physical form	degree of refinement

These variable factors can be controlled. They can be balanced. And once controlled and balanced, this specific combination can be reproduced again and again to give you the results you require in a given environment.

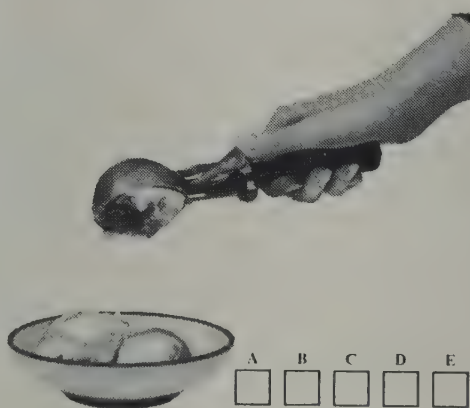
TEST YOURSELF

Suppose you were working with CMC to improve a certain food...to thicken a low pH solution such as a fruit juice drink, for example. Which CMC variable would you usually evaluate first?



A B C D E
☐ ☐ ☐ ☐ ☐

Here's another...say you want to increase the viscosity of a solution of sugar in milk. In this case, which variable would you evaluate first?



A B C D E
☐ ☐ ☐ ☐ ☐

Answers: Thickening solutions of food acids calls primarily for "C", uniformity of carboxymethyl substitution. However, degree of polymerization (A) and degree of carboxymethyl substitution (B) must also be considered. In the case of increasing the viscosity of the sugar solution in milk, you would first consider "A", because the higher the degree of polymerization, the higher the viscosity. Again, other factors such as "B" and "C" should be evaluated. Of course, physical form (D) and degree of refinement (E) are always key factors in food applications.

As you can see, all the variables have a degree of importance. What this test really illustrates is that Du Pont CMC can be delicately adjusted to attain the exact results you require for a particular end-product. You're an expert in food technology and processing. You can tell *when* you've reached the results you want. An expert in CMC knows *how* to get all its superior benefits.

Du Pont's unique "Customer Application Analysis"...

a new concept that may save you time and money.

Recently, Du Pont introduced a program called "Customer Application Analysis". It's designed to help you solve your problems in the shortest possible time. Just give the Du Pont man a few minutes. First, you might let him demonstrate some CMC properties at your desk.



Then he'll record your specific product requirements and other pertinent information, using the new "Customer Application Analysis". From this unique analysis, the Du Pont Development Laboratory will select a CMC that meets your food product needs.

This means you'll get all the services of CMC experts working in a laboratory and plant devoted to getting the maximum in CMC benefits for your product. All you have to do as the first step is to contact your Du Pont man...or mail the coupon.

☐ 1. I have a problem. Please have your representative call to discuss CMC for (indicate type of product and/or application)

☐ 2. I have a question concerning the properties of Sodium CMC.

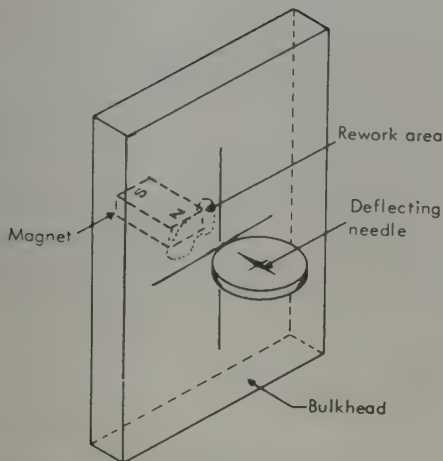
☐ 3. I want to keep up-to-date on CMC developments. Please send literature and put my name on your mailing list.

Name _____ Title _____
 Firm _____
 Street _____
 City _____ State _____ Zip _____
 Telephone No. _____

Mail to: Du Pont, Room 6751-C, Wilmington, Delaware 19898.



Better things for better living
...through chemistry



COMPASS NEEDLE on outside of bulkhead locates the intersection of vertical and horizontal planes of the rework area marked by a bar magnet on the bulkhead's interior face.

Simple Method Marks Interior Bulkhead Faults

A simpler and more efficient technique for marking the position of interior faults on the outside of a bulkhead comes from NASA's Technology Utilization Div. Formerly, workers locate the fault on the inside of bulkhead and transfer the location to the outside by use of layout equipment.

In the new method, the rework area is visually located on the interior face and a simple bar magnet is placed over the spot. Then, a hand-held compass is moved horizontally in the spot area on the outside of the bulkhead until the compass needle is perpendicular to the bulkhead face. This locates the vertical plane.

Next, the compass is tilted 90 deg and moved along the established vertical plane until the needle is perpendicular to the bulkhead face. This locates the horizontal plane. The intersection of the two planes locate the area to be reworked.

The technique is limited to

bulkhead faults that can be seen on the interior face, and primarily to nonmagnetic bulkheads of thin section. Further information on the method can be obtained from the Technology Utilization Officer, Marshall Space Flight Center, Huntsville, Ala. 35812. Reference: M-FS-607

Suggests Procedures For Airslide Car Unloading

The Baker-Miller Committee of the ABA developed the following unloading procedures which should be of practical assistance to processors who receive ingredients in Airslide Cars.

Inspect incoming cars and check all seals — a broken seal may indicate vandalism or theft and the railroad company should be notified immediately.

Open one center hatch on top of car and immediately place a filter or breather bag in position. Care should be taken to ensure that the area surrounding the hatch is free of insects or any contamination which might fall into the car. Blowing around the hatch and under the lip of the cover with compressed air before opening may be the best method.

Open swing hatch covers located at the bottom of each Airslide outlet. Here again care should be taken to see that no insects or foreign material on the ledges above the cover can fall into the transfer unit.

Place transfer unit under car and fasten snugly with the turnbuckles. When not in use, transfer unit must be kept in a dry, clean, rodent-proof area and adequate covers should be placed over the inlets.

Connect all hoses. All hoses

must be capped when not in use to avoid entry of insects, rodents, etc. Make all electrical connections.

Now start activating blower. To successfully unload Airslide cars it is most important that the flour, for example, be thoroughly aerated throughout the car before any attempt is made to unload. It is recommended that only one end of the car be aerated at a time. When attempting to fluidize both ends at the same time the air pressure may not be sufficient to penetrate the flour in all areas of the load. This may lead to bridging or blowing holes up through the flour creating unfluidized areas making it necessary to literally dig that portion of the flour out of the car.

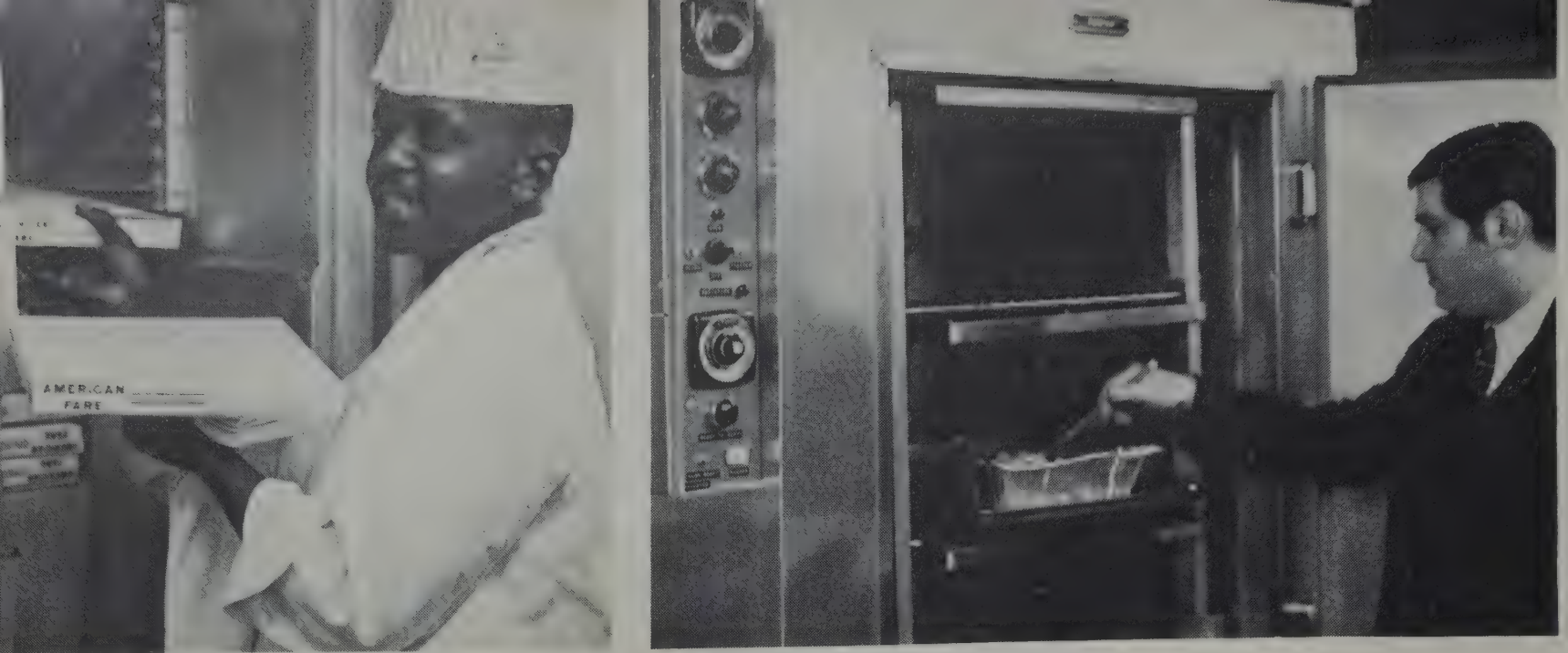
Open the product gates under the rail car. Start product blower. **Caution.** Always start this blower before starting the transfer unit.

Start transfer unit feeder. **Caution.** When unloading is stopped for any reason, always shut off the transfer feeder first.

When unloading is finished, look into the car to make sure all product has been removed before dismantling equipment. Close product gates before removing the transfer unit.

All upper and lower hatches should be closed immediately after unloading to prevent entry of insects or foreign materials into the car during the return trip.

PEPSI-COLA CO. uses a simple method to make wall-mounted fire extinguishers more visible at its new Munster, Ind., plant. Extinguishers are outlined by a rectangle of bright red paint, which also calls attention to a missing extinguisher.



HERE ARE Armour's prepared entrees being transferred from freezer

... TO WARMING UNIT for preparation ...

PROCESSOR and CATERER

With limited space, facilities, and personnel, Canteen Corp. serves Armour's frozen,

CANTEEN CORP. has adapted programmed conveniences to its new concession operations at the International Amphitheater in Chicago. And, these operations look like the pattern of things to come insofar as offering conventioners faster and better food service is concerned.

Canteen has already established an enviable reputation in serving diversified menus to the fast-growing sports and leisure time field. This approach was first introduced at Yankee and Anaheim Stadiums. Successes have triggered strong demands for better concession services in other recreational spots.

Problems Encountered

As a result of the McCormick Place fire, most of Chicago's convention business switched to the

Amphitheater. Canteen took over the food service concession there. When it did, several problems arose. Canteen had to decide how it would replace the stereotyped fare of hamburgers, hot dogs, and cokes with new quality food items and a diversified menu for handling by Canteen's Concessions Division. It had to prepare these foods in a limited 22x48-ft area that included 8x18 ft of freezer storage space. Moreover, it had to serve widely fluctuating numbers of people—roughly 500-15,000 per day—depending upon the size of the convention. Finally, it had to adapt operations to make them flexible for cafeteria and banquet-style serving.

It all boiled down to this: Canteen wanted to be equipped to feed large volumes of people

quickly and profitably with a variety of processor-prepared quality foods, using limited space and personnel.

The clue to these answers stemmed from knowledge of a completely disposable convenience-style, mass-feeding system employed at the University of Maryland. It was a system in which Armour plays a role with its frozen prepared entrees. Canteen's Vice President Dewey Dyer and Banquet & Restaurant Manager William Kaplan visited the University and observed operations. Then, Canteen (with Armour's cooperation) patterned the University's system with modifications to its Amphitheater business.

About the System

Basically, the system involves



... AND THEN TO cafeteria area for portion-serving.

TEAM UP

JOHN V. ZIEMBA

Senior Associate Editor,
"FOOD ENGINEERING," Chicago

prepared entrees to large numbers of conventioners

conveniences programmed into: (1) the purchase of prepared frozen entrees (Armour's Volume, American Fare, and Continental Cuisine Lines), (2) the use of two combination flick-of-the-switch freezer and heating units (Foster's Recons), and (3) the adoption of disposable servers to abolish washing.

Had Canteen not adopted this system, it would have needed ten times as much space, over \$1½-mill. of additional equipment and three times as much kitchen help.

The Volume Fare line of 14 entrees—such as stuffed cabbage rolls, chicken ala king, seafood Newburg, etc.—are prepared at Armour's kitchens, Fairmont, Minn. They're packed, in controlled portions, 18 lb to a 12x20-in. disposable aluminum steam-table pan (Ekco) and frozen. Two

pans are packed into a shelved shipping case. Depending upon the entree, they're quickly heated 20-50 min for serving in a Recon unit.

Armour's American Fare—e.g., beef stew, beef goulash, sirloin tips with mushroom sauce—are bulk-packed in 5-lb. plastic pouches. Six 5-lb pouches are packed per shipper. This line, too, is heated in Recon units.

The Continental Cuisine line includes such items as chicken Aloha and veal parmesan. Entrees are individually packaged in compartmentized flexible film separating meat and sauce from their accompaniments.

Easy Preparation, Transfer

Both lines of entrees are stored in five upright, double-door freezers in the food preparation area.

The night prior to a serving day at a show, the Recons are loaded with pans of entrees. Next morning, the chef flicks switches to change Recons from all-night holding freezers to heating units.

When preparing American Fare, a maximum of 30 pouches (5-lb) are loaded into a Recon. Within 20 min, pouch-packed entrees are ready for serving. There are 15 servings per pouch. So, with both Recons operating, 2,700 portions are readied for serving every hour.

Canteen serves two or three different entrees at a time at the Amphitheater. Heated aluminum pans containing the portion-control entrees are loaded 30 to an electrically heated holding cart. Up to ten carts are hooked up train-fashion to a gas-powered tractor for transfer to various serving areas (portable cafeterias) throughout the Amphitheater.

Two chefs prepare the entrees, whether they are serving 50 or 5,000 people. Only additional help hired are the waiters and servers. How many, of course, depends upon the number of people to be served.

Disposing: Another Convenience

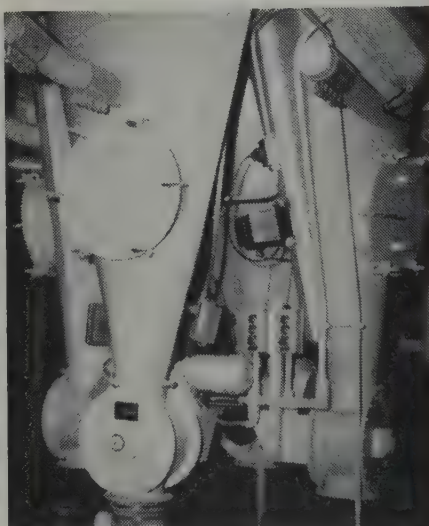
There's no dishwashing because throw-away plastic tableware (plates, cups, utensils, etc.) is employed. Moreover, there's no pot-and-pan washing, since plastic pouches are used for American Fare and disposable

ideability

Saved sugar improves profits at *Kellogg's*

Carter-Day system captures tons of valuable sugar fines!

Airborne sugar fines from one of Kellogg's sugar coated cereals are captured from a hot-air drying system by five Carter-Day Type "RJ" reverse jet dust filters and pneumatically conveyed to a centralized sugar surge bin for recombining with incoming bulk sugar.



Bold engineering achievement. Designed especially for Kellogg's operation, this Carter-Day Pneumatic Receiver collects bran, grain, malt and sugar and distributes them by means of its 4-way hopper compartment—without mixing any of the products. Carter-Day Rotary Airlocks serve the unit.

Thousands of dollars saved each year. That's the record at Kellogg's Omaha, Nebraska plant because of capturing valuable sugar fines. Important! But just one of many reasons why companies such as Kellogg's rely on Carter-Day to help solve all kinds of production and processing problems. Plant and equipment layout, loading and unloading methods, storage facilities and capital investment are some of the areas where Carter-Day can help you. Highly sophisticated, many conveying and filtering innovations are available only from Carter-Day. Write now for the entire, unique Kellogg project story; also conveying and filtering product bulletins.

CARTER-DAY COMPANY

Minneapolis, Minnesota 55418
Canada: Simon-Day Ltd., Winnipeg



A HART-CARTER COMPANY ®

PROCESSOR & CATERER..

(CONTINUED)

steam-table inserts (aluminum pans) for Volume Fare lines.

Canteen has served 7,000 people at one meal and 30,000 meals in a 20-day period. Its operating cafeteria areas handle 300-500 people. What's more, the concessionaire takes care of banquet business when show sponsors rent rooms in the Amphitheater for dinners for 100-5,000 people.

Food Service Efficiency

At the recently held Democratic Convention, Canteen served 60,000 meals and sandwiches to delegates, alternates, workmen, and newsmen. It also provided personal food service to Walter Cronkite, Chet Huntley and David Brinkley. It served over 1,000 meals on a special contract basis to CBS, NBC, ABC, Time-Life, secret service men and others—all blocks away in the Amphitheater and all out of the same kitchen. Canteen's personnel served as many as 40 meals per minute from twin cafeteria lines, with only eight people in the kitchen. The kitchen help didn't have to do any mincing, ricing, slicing, or dicing.

The serving area is about 600 ft away from the kitchen and on another level. Special banquet areas are floors and blocks away.

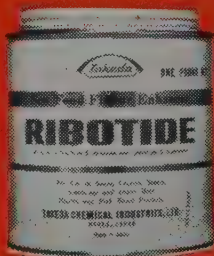
Despite the hectic pace of the convention, the food service program ran like clockwork, sometimes for more than 18 hours a day. As food came in by truck, entrees were rushed into freezers. Rolls, desserts, beverages and sandwiches were held until needed at the serving line. As the evening crowd gathered or rumor of a recess spread, entrees were quickly heated to serving temperature in the "kitchen-less kitchen." Then the heated entrees were moved to the cafeteria line for serving at a moment's notice.

(End)

MSG

100 LB

**½ lb. Ribotide®
replaces 50 lbs.
MSG, saves \$17.50**



and measurably improves flavor at the same time. The spectacular savings effected with this 1-to-100 replacement of MSG with Ribotide can be

achieved wherever MSG is used.

Ribotide is now being widely used to enhance and intensify flavor in many types of foods. It is a mixture of 5'-ribonucleotides composed of 50% each disodium inosinate and disodium guanylate.

Call or write your Takeda representative today for samples and technical assistance.

REPRESENTATIVES:

EAST COAST — EMILIO P. FERRARI, 400 Park Ave., New York 10022, (212) 421-6950 / **DONALD E. FISHER**, Box 130, Belgium, Wisc. 53004, (414) 547-5531 / **WEST COAST** — **JOSEPH P. MANSON**, 5 Corinthian Court No. 31, Tiburon, Calif. 94920, (415) 474-9151 / **CHICAGO** — **CARL W. MATSON**, 300 No. State St., Chicago, 60610, (312) 321-9535 / **SOUTH CENTRAL** — **PAUL A. WEEKE**, 25 So. Beniston Ave., St. Louis, 63105, (314) 863-5538.

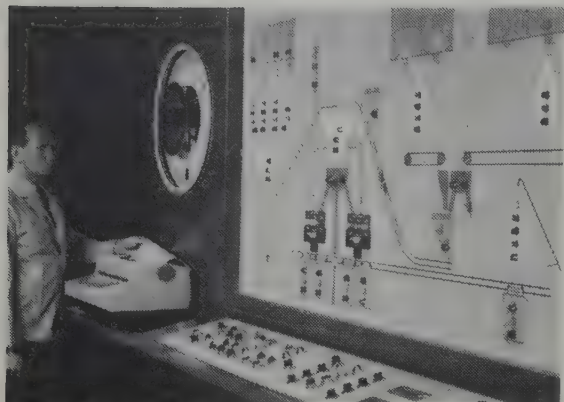


World's largest producer of nucleotides

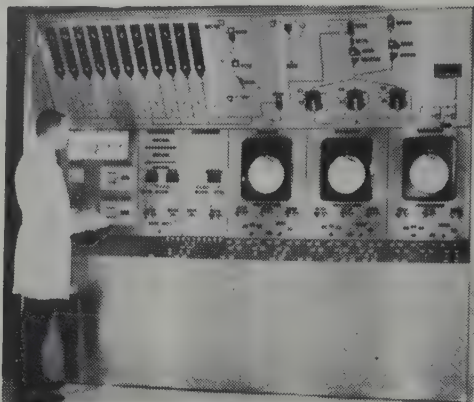
TAKEDA U.S.A., INC.

400 Park Avenue, New York 10022/(212) 421-6950

We've been telling you Toledo® designs and builds automated systems to batch about everything batchable.



Float glass batching system,
Vidrio Plano de Mexico, Mexico City.



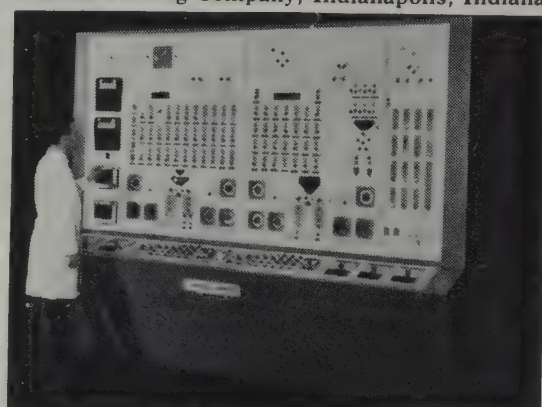
Beer Ingredients batching system
for one of the world's largest brewers.



Sausage batching system,
Eckrich Packing Company, Indianapolis, Indiana.



Glass batching system, Libbey-Owens-Ford Glass Company, Lathrop, California.



Feed supplements batching system,
Dawes Laboratories, Chicago, Illinois.



Rubber batching system,
Kelly-Springfield Tire Company, Tyler, Texas.



Missile fuel batching system, Thiokol Chemical Company, Ogden, Utah.

Obviously, a lot of you have been listening.

The facts prove it. We're busier than ever before coming up with practical solutions for industry's batching problems.

The control consoles you see here are typical of the way we do it. Each one is the command post for an automatic system now on stream. Each one reflects the broad scope of our capabilities.

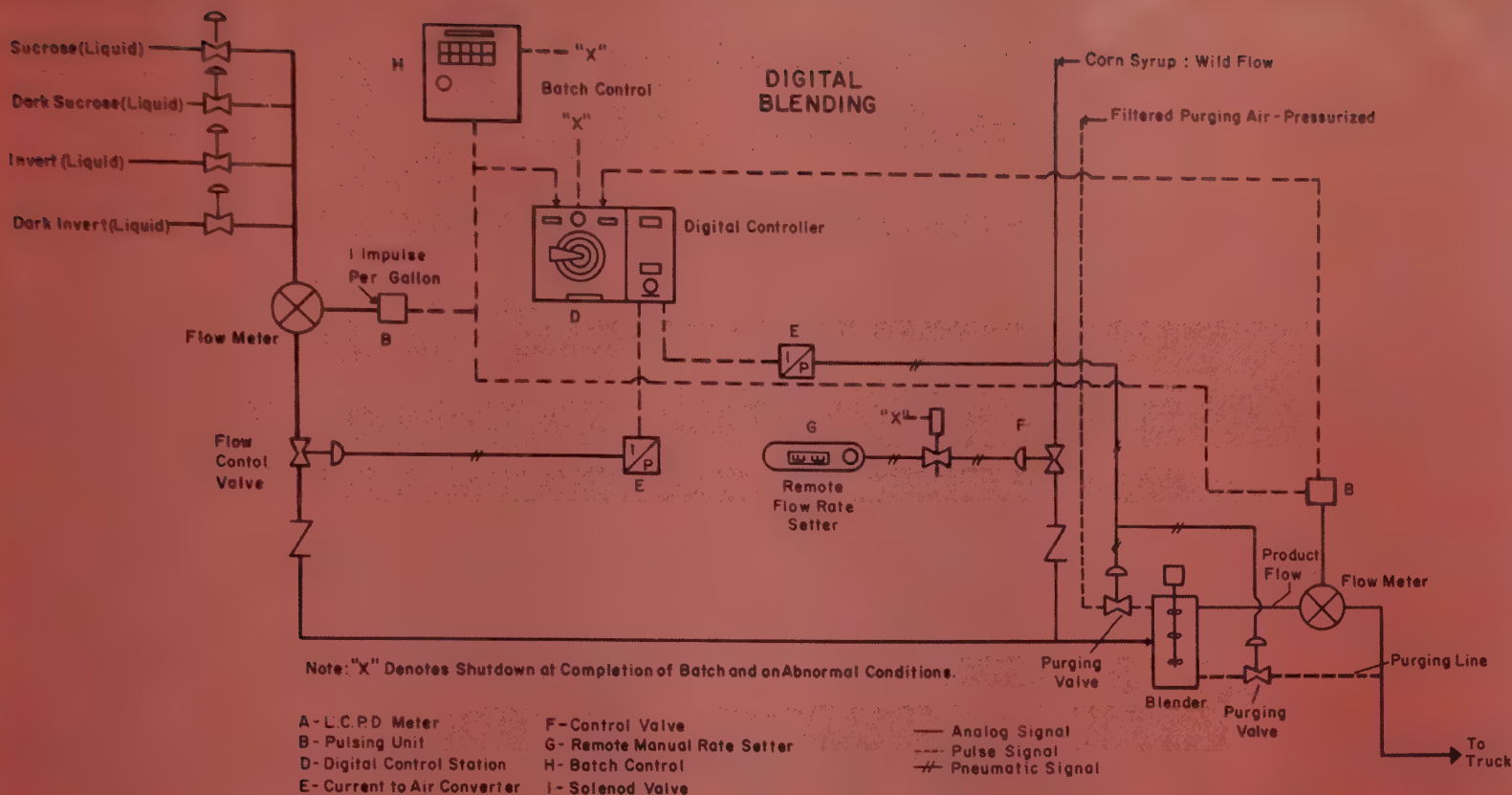
What's *your* batching problem? Is it excessive costs? Quality control? Waste? Ingredients tricky to handle? Whatever it is, our Systems Engineers are ready for it. They'll design and build a complete, automatic system for bulk materials unloading, handling to storage, distribution to processing points, weighing, mixing and routing.

All of it or any part of it. Conventional or solid state controls, with programming and control of processing equipment if your operations call for it.

Please write us, or call to arrange for an exploratory talk with our engineers. It could be the most profitable conversation about batching you've ever had.

TOLEDO SYSTEMS
TOLEDO SCALE COMPANY / TOLEDO, OHIO 43612
DIVISION OF RELIANCE ELECTRIC COMPANY





SCHEMATIC shows the workings of Inland's new in-line blending system that's now producing a wide variety of corn syrup-liquid sugar blends.

WE DID OURSELVES and our customers a lot of good. With a fully automatic, continuous in-line digital blending system (Foxboro) for our sugar blends, that is. It's simple and costs only about \$15,000 to install.

System is now used at Inland Sugar's Chicago refinery to "tailor-make" liquid sugar-corn syrup blends at a moment's notice. Blends are tailored to different ratios (syrup-to-liquid sugar), densities, colors, etc.

Blending is 4-5 times faster than level-gaging in the five batching tanks we used to employ. In just about 20 min, instead of an hour, we pipe a 5,000-gal blend directly from the continuous in-line blending system into a customer-bound tank truck.

Blending operations are more sanitary. Less equipment is used and blends are prepared in a totally enclosed system, which is steam-cleaned in-place at the

GENE SYVERSON, JOHN VAN SCHEPEN and RUDY TIMMER

Respectively, Vice President, Chief Engineer, Production Manager, Inland Sugar Co., Chicago

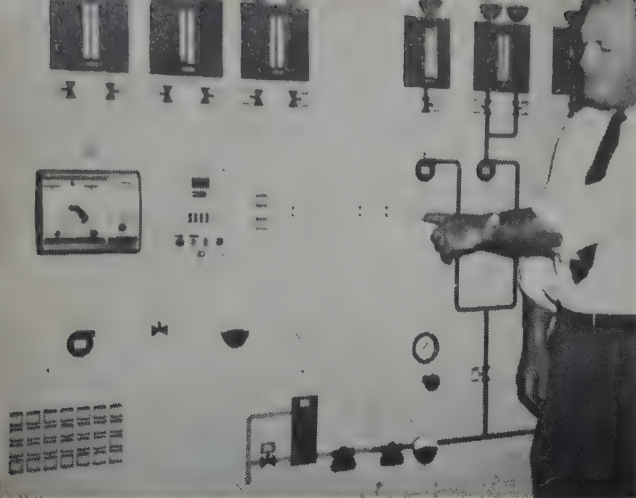
termination of each blending cycle. And blends go directly into tank trucks instead of storage tanks, thus eliminating re-

handling and possible contamination.

More accurate blends are produced by eliminating human

BLENDING DIRECTLY INTO TANKERS

In-line digital blending system that relates demand to output of meters is more accurate, sanitary, and faster than former batching. Benefits sugar-blend users, too.



GENE SYVERSON, co-author, initiates the in-line digital blending system from master control panel.

BLENDS DIRECTLY . . . (CONTINUED)

errors. Blends are made up in precise proportions and to specification. A pneumatically operated purging system prevents any residual carry-over into a new and different blend. The new in-line blending system oc-

cupies only 225 sq ft of space. Former 5-tank batch-blending system required 3,600 sq ft. Moreover, there is no need for in-plant storage and carrying an inventory of specialty products.

What the System Comprises

Inland's in-line blending system comprises a continuous liquid-type blender (Lightnin's Mixer Column) mated with two positive - displacement meters (Liquid Controls) and Foxboro's electronic digital blending control station (see diagram). Three basic modules—digital controller, standardizer and ratio unit—make up the control station. And, a purging arrangement cleans the system when a run is completed.

The liquid sugar input is metered and instrument-controlled. Since 80-Brix corn syrup is difficult to meter accurately because of its high viscosity, its flow through heated jacket line and into the continuous liquid blender is "wild" (uncontrolled by instrument). Its flow rate is set manually, and its volume represents the difference between total flow and liquid-sugar flow which are metered.

The digital control station is the key to the whole thing. It relates demand (set point) to output of both meters to maintain correct proportion of liquid sugar to corn syrup. Any deviation (error count) is converted to an analog signal that controls an air-operated valve in the liquid-sugar line. An electric-to-pneumatic converter accomplishes that.

Correct values for measurement and demand pulses are assigned at instrument system's electronically operated count standardizer. Thus, each pulse—measurement or demand—represents a definite amount of sweetener being measured. The

new!

*the Vanmark Feeder
with an Inclined Screw
that works!*



**HANDLES PRODUCT
DAMAGE-FREE,
ACCURATE FEEDING,
HIGH CAPACITY,
EASY MAINTENANCE**

Whether slicing or dicing the Vanmark Feeder will fit right into your production line. Economically, competitively priced!

Smooth, continuous flow with precise control . . . can feed only one potato at a time . . . up to your limit. Variable speed to suit your operation. Does away with bucket elevators and other forms of feeding. Easy to clean, cuts clean-up time.

BEAUTIFUL STAINLESS STEEL CONSTRUCTION

HOPPER BASE AVAILABLE IN DIFFERENT SIZES

WRITE DEPT. FE-12



VANMARK CORPORATION

215 NORTH WALNUT STREET □ CRESTON, IOWA 50801 □ PHONE 515-782-7014

instrument system's third component, the ratio unit, determines how much of each component goes into a blend.

Inland's digital blending system is of the memory type. That is, it has the capability of storing error pulses caused by a deficient component—corn syrup, in our case. As normal syrup flow resumes, the control system makes up for the deficiency. In the event that the system is off 3% in either direction from set point, it automatically shuts down. Alarms sound at the same time.

The system has proven so successful that Inland is now designing and modifying it to expand the company's line of sugar blends. Through installation of a gravimetric weigher-feeder, dextrose (granular) will be continuously blended with liquid sweeteners (corn syrup and liquid sugar). (End)

Stouffer's new warehouse: imagination on a colossal scale, walls of FOAMGLAS® insulation.

Stouffer Foods' new high-rise warehouse in Solon, Ohio, is an innovation in the automated handling and storage of frozen foods. It can store 9,000 pallets on 13 levels. That's a capacity of more than 18 million lbs. of frozen foods, protected on all sides by FOAMGLAS insulation blocks.

Walls went up fast because FOAMGLAS insulation is the walls. FOAMGLAS cellular glass blocks are strong, lightweight and dimensionally stable. They trap still, dry air—the ideal insulation

medium—in millions of closed glass cells.

FOAMGLAS insulation gives you a rigid building shell that's waterproof, vaporproof, rodentproof and incombustible. One that always maintains full insulation value.

For a sample of FOAMGLAS and details of the Black Box low-temp warehouse design, write Pittsburgh Corning Corp., Dept. FE-128, One Gateway Center, Pittsburgh, Pa. 15222. In Western Europe, contact Pittsburgh Corning de Belgique, S.A., Brussels.

**Quality
chain
at low
prices?
...certainly!**

U.S. Import searches world markets for finest quality — has exclusive contracts with, and only with, leading world manufacturers. Resulting import prices may seem low for roller chain of such fine quality.

FOR FOOD PROCESSING — finest heat treated steel chain, or non-magnetic stainless — solid rollers — extended pitch conveyor chain also. Strict quality control; exceeds ASA standards — all standard sizes for replacement or OEM. Write for prices.

(Four U.S. warehouses speed delivery and service)



DISTRIBUTOR INQUIRIES INVITED

U.S. IMPORT
Equipment Distributors, Inc.

"We Search the World for the Best"

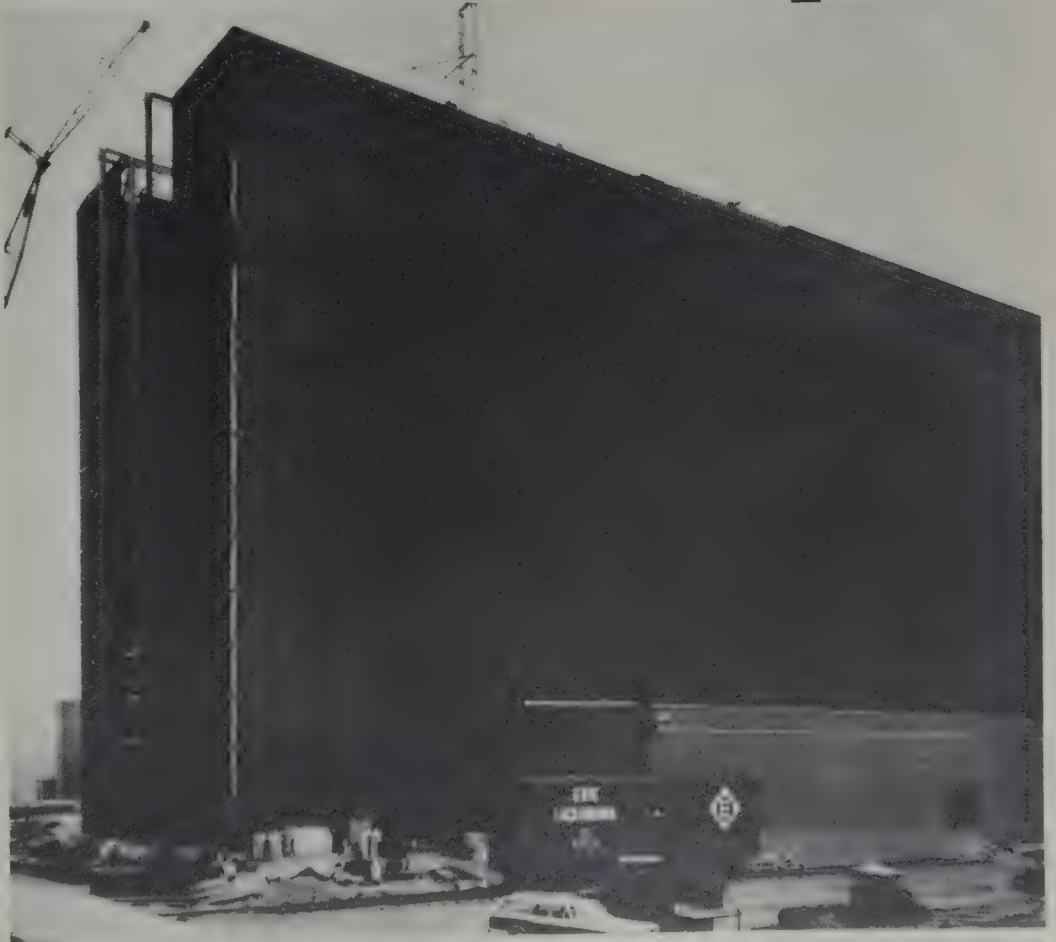
1409 Santa Fe Avenue • Los Angeles 90021

Telephone: (213) 627-1887

The Insulation People

PITTSBURGH
pc
CORNING

Insulation contractor: Sprinkmann Sons Corp.

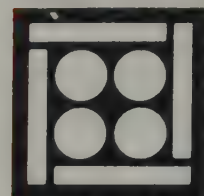


Circle 53 on Inquiry Card

Circle 52 on Inquiry Card

SEAMS LIKE FOREVER...

COME SEE US



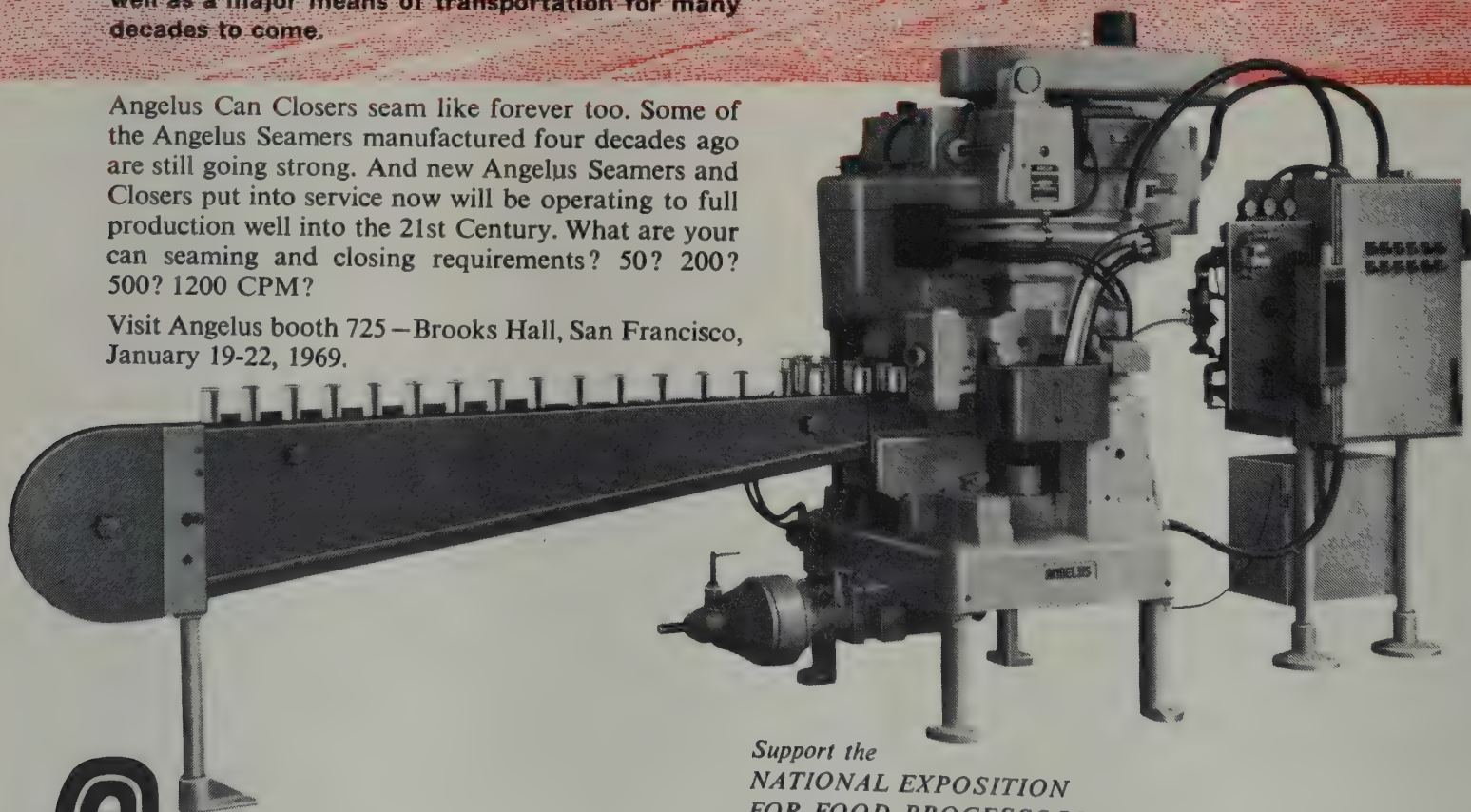
NATIONAL
EXPOSITION
FOR FOOD
PROCESSORS®

January 19-22, 1969
San Francisco, California

Seems like forever that the famed cable cars have been making their way up and down the slopes of San Francisco. They'll be a tourist attraction as well as a major means of transportation for many decades to come.

Angelus Can Closers seam like forever too. Some of the Angelus Seamers manufactured four decades ago are still going strong. And new Angelus Seamers and Closers put into service now will be operating to full production well into the 21st Century. What are your can seaming and closing requirements? 50? 200? 500? 1200 CPM?

Visit Angelus booth 725 - Brooks Hall, San Francisco, January 19-22, 1969.

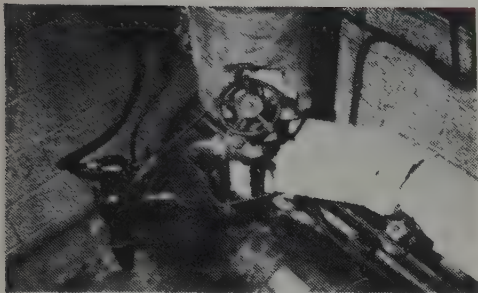


Support the
NATIONAL EXPOSITION
FOR FOOD PROCESSORS,
presented by the Food Processing
Machinery & Supplies Association.

ANGELUS

SANITARY CAN MACHINE COMPANY

Cable Address "Angelmaco" Western Union Code • 4900 Pacific Blvd. • Los Angeles, California 90058



NARROW PIT (above) was too small to house a conventional pump for this Dowtherm heating system. The compact canned motor-type pump (below) solved the problem.

WISE POTATO CHIP CO. Solves Space Problem With Special Pump

The unusually compact design of canned motor-type pumps solved a knotty space problem for Wise Potato Chip Co. at its Berwick, Pa., plant.

Taking advantage of advanced heat-transfer techniques, Wise designed a new Dowtherm loop heating unit for its cooking oils. In this system, the oil circulates in one loop, while heated Dowtherm, a heat-transfer fluid, circulates in another. As the two fluids pass through a heat exchanger, the oil is raised to cooking temperature.

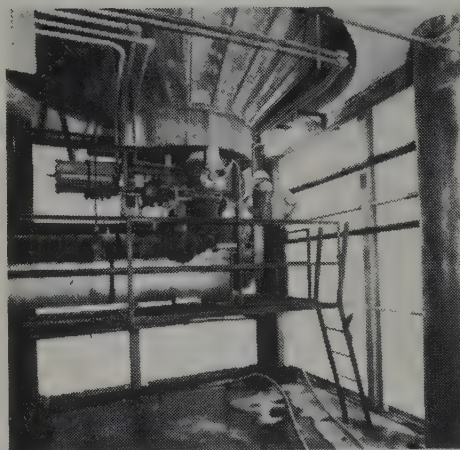
The space problem arose in installing the necessary pumps, piping and valves for the unit. The only space available for the fluid system was a narrow pit too small for conventional pumps.

The problem was solved by using the canned motor-type pumps, called "Crane-Chem-

pumps." They are about half the size of comparable conventional centrifugal pumps—and they offer two important bonus features. The units are leakproof, so prevent loss of the relatively expensive Dowtherm. And their special design offers a practically maintenance-free unit.

According to Wise, the pumps are in constant use 24 hours a day, five days a week. Yet, some have operated for two years without the need for bearing replacement.

The pumps are supplied by the Crane Co., Chicago. (391)



WEATHER ENCLOSURE of PVC sheet and plastic columns and girts resists corrosive sulphur-dioxide vapors in corn-softening operation.

AMERICAN MAIZE PRODUCTS CO. Uses Corrosion-Resistant All-Plastic Enclosure

Columns and girts of fiberglass-reinforced plastic, which support a weather enclosure of corrugated PVC sheet for valves and conveyor machinery, offer three prime advantages in corn processing at American Maize Products Co., Roby, Ill.

The enclosure is installed beneath tanks containing a sulphur-dioxide solution heated to 125F.

Although vapors from the solution create a corrosive atmosphere in the enclosure, the plastic columns and girts have resisted corrosion. In addition, the structural components have eliminated maintenance (no painting required) and were installed at low cost.

A structural framework for the PVC sheet was made with 16 columns (6-in. H-beams) and 3 girts (4-in. channel) between each pair of columns. Holes were drilled in the plastic components and stainless-steel bolts were used as fasteners.

The structural components, called "RP," are produced in stock shapes by Koppers Co., Inc., Pittsburgh, Pa. (392)

NEW ENGLAND FARMS PACKING CO.

Packages Citrus Fruits At 20-25 Bags Per Min

With its new form-fill-tie machine, a fully automatic unit, New England Farms Packing Co. of Arlington, Mass., meets its production requirements in half the time and with less than half the labor formerly employed.

The "Model 38" unit is equipped with an electronic counter and fruit loader. In operation, it forms gusset-bottom polyethylene bags from pre-printed roll stock. Then, it imprints a price or message in registration, and punches vent holes up to 1/2-in.-diam in any number of pre-determined locations.

Oranges, lemons or grapefruit are elevated from a feed bin to an orienting and counting carousel, where the fruit is gently segregated, counted and sent down a loading chute into a formed bag. The filled bag is then top-gath-

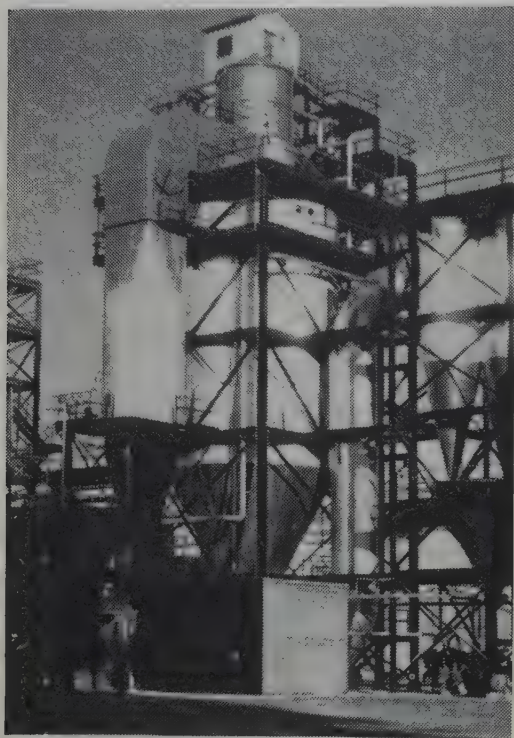
For more data, circle item numbers on card at back of issue.

a frequent drying problem

do you spray it...or convey it?

only PROCTOR

can give you an unbiased recommendation



PROCTOR is the *only* manufacturer of *both* spray dryers and conveyor dryers.

Therefore, when you face the question of how *best* to dry a given product, only PROCTOR can be *truly* objective; only PROCTOR can evaluate pre-quotation laboratory tests *without* prejudice.

You can't afford to overlook PROCTOR when asking, "Do I spray it or convey it?"

There are other reasons why you can't afford to overlook PROCTOR:

- Modern facilities, modern tooling and modern modular designs keep PROCTOR in the top competitive price position;
- PROCTOR dryers are sold with a full performance guarantee;
- Careful attention to detail before, during and after installation makes PROCTOR service tops in the field.



*It will pay you to call your
PROCTOR Sales Engineer today.*

PROCTOR & SCHWARTZ, Inc.

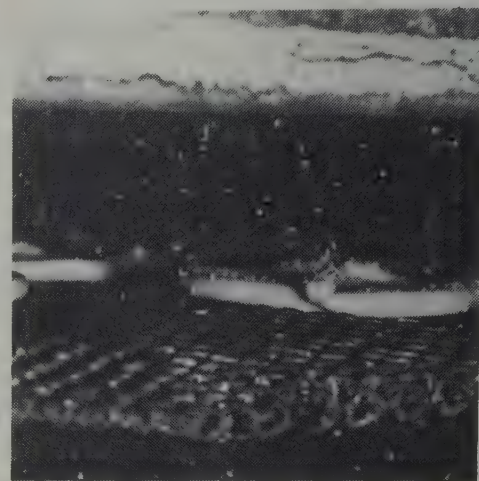
Seventh Street & Tabor Road, Philadelphia 20, Pennsylvania 215 DAVenport 9-6400

PROCTOR has it...EQUIPMENT ENGINEERED FOR YOUR PRODUCT

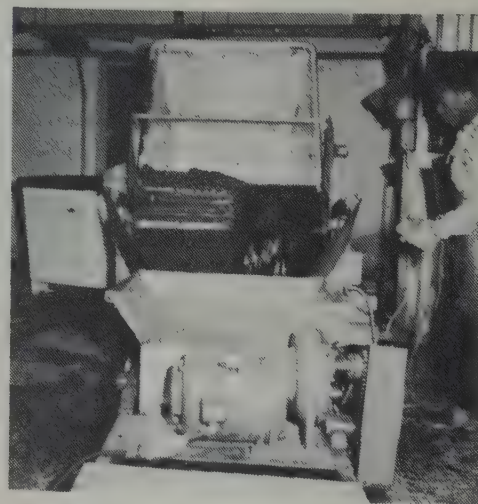
Doing It Better

ered, twist-tied and conveyed to a circular pack-off table.

The packaging system is manufactured by Bodday Packaging Machinery Inc., Springfield, Mass. (393)



PRETZELS at Rold Gold Div., Frito-Lay, Inc., St. Louis, Mo., move through a hot caustic bath and are carried under a salt dispenser which applies salt (Hardy Pretzel Salt) to the top of hot, moist pretzels. Excess salt drops into conveyor unit and is carried back to hopper for re-use. Salt does not break up so there is little waste. Product is white and has good "laying power". Special salt is supplied by Hardy Salt Co., St. Louis, Mo. (394)



MEIER'S WINE CELLARS, INC., Sandusky, Ohio, speeds handling of crushed grapes with a hydraulic dumper. The unit (Tubar) picks up a fiberglass bin holding a ton of grapes, and dumps the contents into vats for wine making. Formerly, the grapes were packed in small wooden boxes, which took more than twice as long to handle. The dumper is manufactured by Uhrden, Inc., Sugarcreek, Ohio. (395)



CARROT FLAKES are product of a continuous double-drum drying process. Two pounds of fresh raw carrot will produce about 1/5 lb of dehydrated flakes.

DRUM-DRIES CARROT PUREE

Double drum-drying for continuous production of dehydrated carrot flakes offers quality product with good production output

G. M. ZIEGLER, JR. and J. J. SPADARO

Southern Regional Research Laboratory,
Agricultural Research Service, USDA, New Orleans, La.

DOUBLE DRUM-DRYING of carrot flakes is feasible and produces a very good and acceptable instant precooked product according to research findings of the Engineering and Development Laboratory, Food Products Investigations, Southern Utilization Research and Development Div., Agriculture Research Service, USDA. Continuous carrot-flake process offers short dryer retention time and good production rate.

Two different double drum-dryers (24 in. by 24 in. with close-grained iron-faced rolls, and 12 in. by 19 in. chrome-plated close-grained iron rolls) were used in the experiments. Roll surfaces seem to have no visual effect on product color or qualities.

Flakes Offer Wide Usage

An increase in drum steam pressure and a relative decrease in retention time increases the production rate while flake moisture remains constant. Production rates were at a maximum when the total solids of cooked puree were about the same as for uncooked carrots and dropped off with increasing total solids.

Canners of carrot puree for baby foods or special dietary foods could, by simple diversion of part of the puree to a double drum-dryer, produce commercially dehydrated carrot flakes. Conventional canning operations could utilize reject and low-quality carrot pieces with cooking and double drum-drying to gain a higher valued product.

Dehydrated flakes hold potential as an ingredient in instant soup mixes or mixed vegetable juice drinks, as a dehydrated baby food for exporting, or for supply to institutions for special diets in geriatric care.

Pilot plant production at the USDA center consists of washing, trimming, and size reduction of whole carrots. Cuts of carrot ($\frac{3}{8}$ in. by $\frac{5}{8}$ in. strips) were cooked 38 min at about 212F in a steam jacketed (3 psig) screw-type cooker. Cooked strips then pass through a pulper with a 0.06-in. round hole screen, and onto a double drum-dryer.

Reconstitution of the flakes with hot water yields a puree that was indistinguishable on preference-acceptability ratings with the original cooked puree. (End)

SPACE SPRAYS

MORE EFFECTIVE NOW

Synergized pyrethrins are more lethal against crawling insects and safer for humans as result of new regulation.

Beneficial for grain and flour mills—storage, too

GRAIN AND FLOUR millers and those responsible for flour storage will be glad to note a change in federal regulations which permits the use of more effective space sprays.

Synergized pyrethrins have long been preferred as insecticides for grain and flour mills because of both their high effectiveness against insects and their safety for humans. They can now be made even more effective against crawling insects.

The modified Food Additive regulations for pyrethrins (121.1075) and piperonyl butoxide (121.1074), are a result of Food Additives Petition 5H1740 filed by West Chemical Products, Inc., and were published in the Federal Register, Dec. 7, 1966. Original regulations required that these ingredients be present in an insecticide in the ratio of 1:10 when used in cereal-grains mills or in storage areas for milled cereal-grain products. The amended regulations accept space sprays in which the ingredients are present in any ratio from 1:1 to 1:10.

Originally, the fixed 1:10 ratio of pyrethrins to piperonyl butoxide for cereal-grain mills was established to protect the public against excessive insecticide residues in flour as a result of space-spray treatments. At that time, there was no analytical method that could detect pyrethrins in flour at levels near one part-per-million; analytical procedures were available only for the piperonyl butoxide. By establishing a maximum tolerance of 10 ppm for piperonyl butoxide in flour, and by allowing only sprays of a 1:10 ratio of pyrethrins to piperonyl butoxide, the FDA has ensured that pyrethrins in a food product would automatically be kept within acceptable limits of one ppm or less.

Why the Change?

While this regulation provided a satisfactory means of controlling insecticide residues, it also restricted the selection and use of insecticides based on their effectiveness, particularly for the control of crawling insects. Piper-

onyl butoxide enhances the effectiveness of pyrethrins in space sprays against flying insects, but the value of the sprays in controlling crawling insects depends largely on the content of pyrethrins.

For control of the exposed stages of confused flour beetles, saw-toothed grain beetles, cockroaches and other crawling insect pests, it is preferable to fog with a considerably higher ratio of pyrethrins to piperonyl butoxide—even approach 1:1.

A side benefit of increasing the ratio of pyrethrins in a space spray is to reduce the amount of irritation to the men applying the spray. Piperonyl butoxide is the prime irritant in such sprays.

On the other hand, controlling these insects effectively with a space spray in the specified 1:10 ratio requires a higher dosage of the spray than is generally recommended. An unfortunate result is saturation of the area with the base oil that acts as a carrier for the active ingredients. Clearly, a new formulation was needed.

TABLE I. FOGGING TEST METHOD
Dosage vs Pyrethrins Concentration

Insecticide	Dosage Per 100 Cu Ft	No. of Replicates	Total No. Of Roaches	% Moribund In 1 Hr	% Mortality 24 Hr	% Mortality 48 Hr
.4% pyrethrins						
.5% P.B.O.	.2 oz.	5	100	88	91	94
.1% pyrethrins						
1.0% P.B.O.	.2 oz.	5	100	23	31	39
Same	.4 oz.	5	100	44	55	60
Same	.6 oz.	5	100	67	70	76
Same	.8 oz.	5	100	85	95	96

P. G. BARTLETT and H. W. SHAVER

West Chemical Products, Inc., Long Island City, N. Y.

Importance of Pyrethrins

Control of crawling insects is primarily dependent on the pyrethrin content in a space spray—as reported by R. W. Whiting in 1959 (Ref. 1). Whiting used two distinct test methods—the “Official C.S.M.A. Cockroach Spray Test Method” (Ref. 2) and a “Fogging Test Method for Evaluation of Insecticides against Cockroaches” (Ref. 3). His experiments contradicted the findings of an earlier study reported in 1952 (Ref. 4) by E. J. Incho who used only the first of these test methods and a higher dosage of insecticide.

The C.S.M.A. method requires the test insecticide to be sprayed directly downward from a height of 28 in. onto the test cockroaches on the screen bottom of a 5.25-cu ft box. It is primarily designed to determine the relative efficiency of contact insecticides in oil as cockroach sprays.

The Fogging Test Method requires that the test insecticide be dispensed horizontally into a 100-cu ft chamber as a fog of optimum size particles. Since fogging intro-

duces some insecticide directly into the hiding places where cockroaches seek shelter, creating “drive-out action” (Ref. 5), it is very effective in controlling crawling pests.

Additional studies made at West Chemical’s entomological laboratory support Whiting’s findings: Pyrethrin concentration in air regulates the effectiveness of insecticidal fogs against crawling insects. Table I, summarizing these studies, shows that it requires four times the dosage of a spray containing 0.1% pyrethrins to equal the effectiveness of a spray containing 0.4% pyrethrins, even though there is twice as much piperonyl butoxide in the insecticide containing 0.1% pyrethrins. When this insecticide is applied at four times the dosage, there is eight times as much piperonyl butoxide present per cubic foot of air, as well as four times as much base oil.

Analysis for Pyrethrins

No changes could be contemplated in the federal regulations

BOOSTS SALES

AS EASY AS PIE

STABILIZER 254

Of course your pies taste good! But Germantown’s STABILIZER 254 can make them taste even better . . . and what’s more it will make them look as good as they taste.

Fruit Pies: STABILIZER 254 improves flavor and mouth feel, overcomes pastiness, and gives you control of filling consistency.

Pumpkin Pies: Surface cracking and shrinkage of filling are eliminated with STABILIZER 254 and uniform thickness of pies is maintained.

Meringues: STABILIZER 254 produces a light fluffy meringue which does not become tough and rubbery, cuts well, and is free from water moisture.

How can you go about giving your pies “mouth appeal” and “eye appeal” with STABILIZER 254? Ask your Stabilizer Advisor—he’s just a phone call away.

EG **ermantown**
SPECIALIZERS IN STABILIZERS

Manufacturing Company

BROOMALL, PA. 19008 • (215) KI 4-8400

Warehouse stocks in major U.S. cities and in Mexico, Canada, and Australia

so long as the fixed 1:10 ratio was still needed to protect the public against excessive insecticide residues in flour. Clearly what was needed next was an analytical method for the detection of pyrethrins. For this purpose, West Chemical established a joint project with McLaughlin, Gormley, King Company, a major extractor of pyrethrins and supplier of

insecticidal concentrates. They, in turn, enlisted the aid of Dr. W. N. Bruce, entomologist at Illinois Natural History Survey, Urbana, Ill. The result of the work of Dr. Bruce and his associates was an improved electron-capture type cell for use in gas chromatography. This improved cell has unusual sensitivity to organophosphorous insecticides, especially to

pyrethrins, synergists, and other compounds not easily detected with the ordinary electron capture cell (Ref. 6).

Tests on Flour

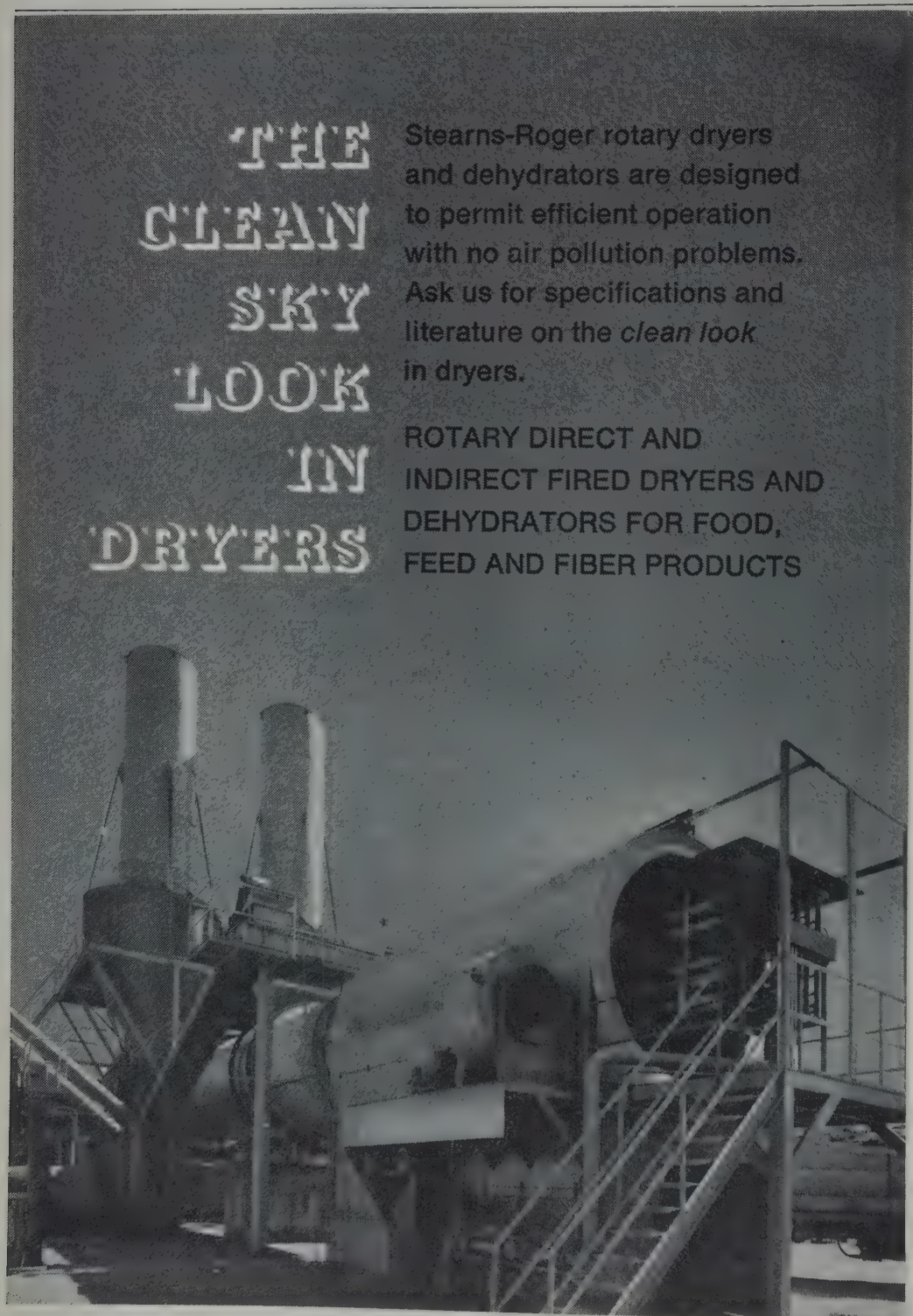
Once this analytical procedure for detecting residues of pyrethrins had been perfected, series of tests were run to determine the residues in flour samples. In one series, commercially available baking flour was used as a base, while another series used Pyrax ABB, an inert substance that cannot interfere with the extraction procedures but which is similar in its physical properties to flour.

Samples were placed in 100-cu ft test chambers, some in uncovered glass jars, some in covered jars with the lid raised $\frac{1}{2}$ in.—to simulate conditions where flour is protected from direct spray fallout—and some in 2-ply Kraft paper bags. Chamber was then fogged with space sprays containing a 1:10 and a 4:5 ratio of pyrethrin to synergist, some samples receiving one and some two applications. Samples receiving only one application were held in the chamber 24 hr after treatment, then removed for analysis. The other samples remained in the chamber one week, then subjected to the second treatment and removed 24 hr later.

Samples for analysis consisted of the top half-inch of material in the uncovered and partly covered jars, the next inch of material in the uncovered jars, and the top half-inch of material in the paper bags. All samples were stored in glass jars, sealed in corrugated paper cartons, for about two months before analysis.

What the Results Show

These tests proved that a wide margin of safety remains for fogging cereal-grain mills and flour-storage areas, even when insecticides containing greater concentrations of pyrethrins are used—and consequently highly effec-



**THE
CLEAN
SKY
LOOK
IN
DRYERS**

Stearns-Roger rotary dryers and dehydrators are designed to permit efficient operation with no air pollution problems. Ask us for specifications and literature on the *clean look* in dryers.

ROTARY DIRECT AND INDIRECT FIRED DRYERS AND DEHYDRATORS FOR FOOD, FEED AND FIBER PRODUCTS

Stearns-Roger
CORPORATION

Food Industries
Division

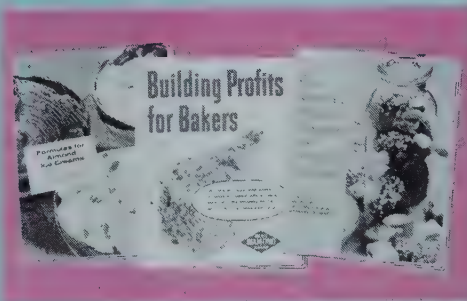
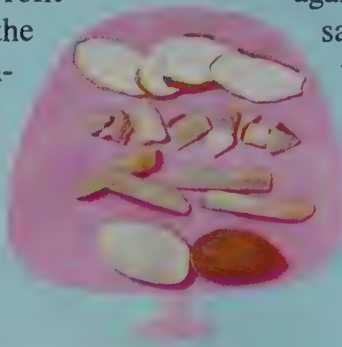
P.O. BOX 5888, DENVER, COLORADO 80217 • PHONE 303/222/8484



'most anything you make goes better with almonds

Whether you sell consumer foods, pastries, ice cream or candies, there's a profit idea in a study by the Food & Lodging Institute. It showed restaurant items (fish) with almonds commanded an average 17%

premium over the same items without almonds. It proves again how often shoppers say, "I'll take the one with almonds". We supply them whole, halved, diced, sliced or slivered. Just tell us how you want them.



FORMULA BOOKS are available for bakers, confectioners, and ice cream makers plus some special formulas for food processors. Tell us which you want. On your letterhead, please.

**CALIFORNIA ALMOND
GROWERS EXCHANGE**

P.O. Box 1768, SACRAMENTO, CALIF. 95808



ALMONDS
FROM CALIFORNIA



SPACE SPRAYS . . . (CONTINUED)

tive at relatively low dosages. Exposed samples receiving two dosages of the more highly concentrated formula at 0.4 oz per 100 cu ft had a residue of pyrethrins only slightly higher than when the less concentrated formula was used at 0.8 oz per 100 cu ft. In these cases, the residue was still only $\frac{1}{3}$ to $\frac{1}{5}$ the maximum allowable residue of one part per million.

In the case of the covered or bagged samples, residues of pyrethrins from the concentrated formula exceeded those from the less concentrated formula only when two applications were made at double the recommended dosage. The residues still remained within acceptable limits.

In all these samples, residues of the synergist, piperonyl butoxide, from the concentrated for-

mula was only $\frac{1}{20}$ of the permissible limit of 10 ppm. To exceed the residue tolerance for pyrethrins of 1 ppm, the more concentrated formula would have to be used at a rate of 1.4 oz per 100 cu ft—seven times the recommended dosage of 0.2 oz per 100 cu ft, which has been proven to be most efficient against cockroaches.

Close similarity between the results on Pyrax and on flour showed that the newly developed analytical method was recovering all or nearly all of the residue in the flour. In other words, an analytical procedure was now available to detect pyrethrins in flour at levels near one part per million.

When Petition 5H1740 was submitted to the FDA, it was accompanied by a description of the new analytical method for the detection of residues of pyrethrin, together with summaries of the tests. The modified federal regulation resulting from this petition now permits millers to use space sprays that are more effective on crawling pests, are less irritating to the operator, and can be used in smaller quantities, thus requiring less spraying time and leaving less deposit of oily carrier than has been possible previously.

REFERENCES

1. Whiting, R. W. "Tests show roach control depends largely on pyrethrin concentration," *Modern Sanitation*, Dec. 1959.
2. "Cockroach spray method—official method of C.S.M.A. for evaluating liquid household insecticides against crawling insect pests." *Soap and Chemical Specialties Blue Book Catalog* 1965.
3. Rich, H. R. and Brett, R. L. "Fogging test method for evaluation of insecticides against roaches." *Proceedings of the 40th Midyear Meeting of C.S.M.A.*, May 1953.
4. Incho, E. J. "Ratios of piperonyl butoxide and pyrethrins for german cockroach control." *Soap and Sanitary Chemicals*, Feb. 1952.
5. Whiting, R. W. "Quantitative data on difficulty of driving insects out of hiding." *Food Processing*, April 1960.
6. Bruce, W. N. "A detector cell for measuring picogram quantities of organophosphorous insecticides, pyrethrin synergists, and other compounds by gas chromatography." *Journal of Agricultural and Food Chemistry*, Jan.-Feb. 1967, Vol. 15, No. 1, p. 178-181.



With flexible Tygon B-44-3 Food and Beverage Hose, you can have that temporary piping set-up in operation in minutes, instead of hours or days. You'll also find that Tygon can give a versatility you never thought possible to your existing rigid pipelines.

Lightweight, easy to handle and available in running lengths, Tygon plastic Tubing simply curves around corners and obstacles—does away with nearly all fittings and couplings.

What's more, Tygon B-44-3 hose is glass-clear—you can *visually* check and control flow.

Odorless and tasteless...completely safe (meets all Food and Drug Administration requirements)...easily cleaned in place...Tygon belongs in YOUR plant. CALL YOUR AUTHORIZED TYGON DISTRIBUTOR TODAY...OR WRITE FOR FREE 28-PAGE BULLETIN T-102 CONTAINING COMPLETE INFORMATION.

"TYGON" is a registered trademark of U. S. Stoneware, Inc.

NORTON U.S. STONEWARE INC.
PLASTICS & SYNTHETICS DIVISION · AKRON, OHIO 44309



COPY SUGGESTED BY AN ESSAY OF THOMAS CARLYLE

PHOTOGRAPHY BY ARTHUR D'ARAZIEN

'Not a dynamo hums but a man becomes its planner' New-foods men plan MOR-REX

WHAT IT IS: MOR-REX® Hydrolyzed Cereal Solids. Snow-white, edible carbohydrate. Bland taste. Instantly soluble. Low in bulk density, viscosity and moisture pick-up. Minimum protein browning. FDA. GRAS.

WHAT IT DOES: Makes difficult materials easier to dry. Adds mouthfeel to beverages. Anti-caking agent. Excellent coating. Vehicle for synthetic sweeteners. Replaces gum arabic in flavor encapsulation. Adds body.

WHAT IT'S FOR: Dry soup, spice and bakery mixes. Low calorie foods. Formulated dairy products. Flavors and coatings. Beverage powders. Spray dried food ingredients. And many more. Write for literature and samples.



CORN PRODUCTS INDUSTRIAL • Division Corn Products Company, Englewood Cliffs, N. J. 07632

Now, from your Dodge distributor, 3 more famous names.

RELIANCE REEVES MASTER

Reliance, Reeves and Master... names you know and can depend upon have been added to the Dodge line and are now available from distributors' stocks. *What a line-up!*

Reliance Duty Master A-C Motors—1/4 to 250 hp.

Master XL Gearmotors—1/6 to 40 hp.

Reeves Vari-Speed Motodrives—1/4 to 50 hp.

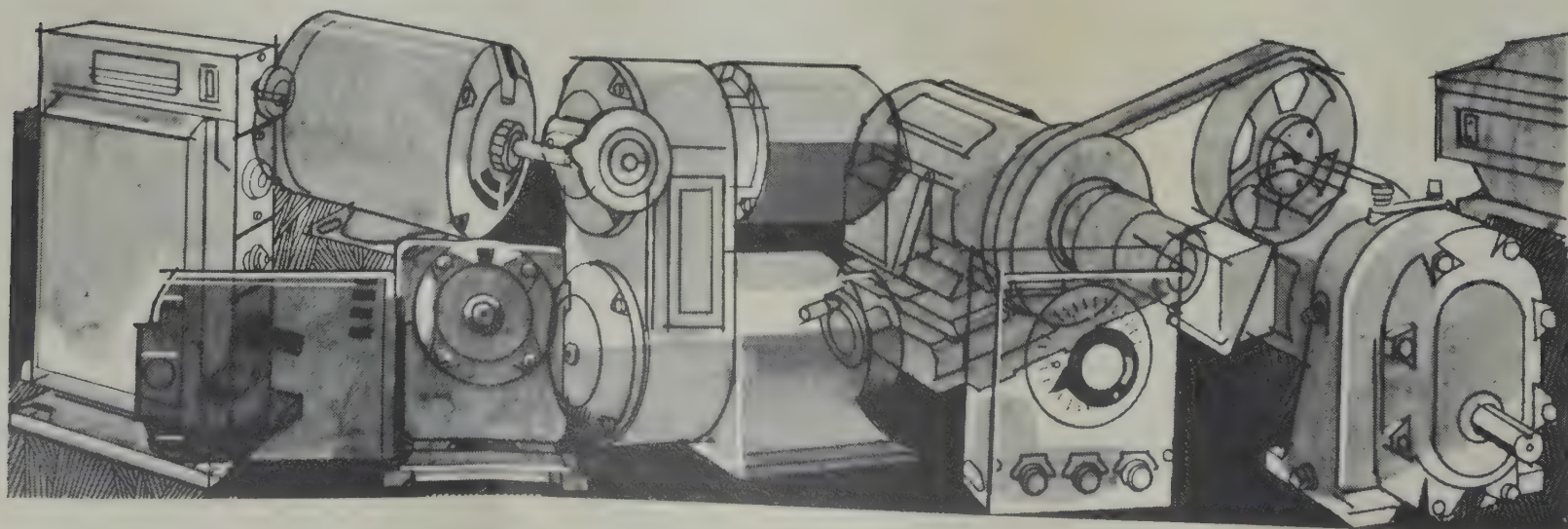
Reeves Vari-Speed Motor Pulleys—1/2 to 15 hp.

Reliance V★S Electrical Adjustable Speed Drives
—Solid state rectifier power module, motor and remote control station.

Reeves VST Mechanical Adjustable Speed Drives
—1/4 to 50 hp.

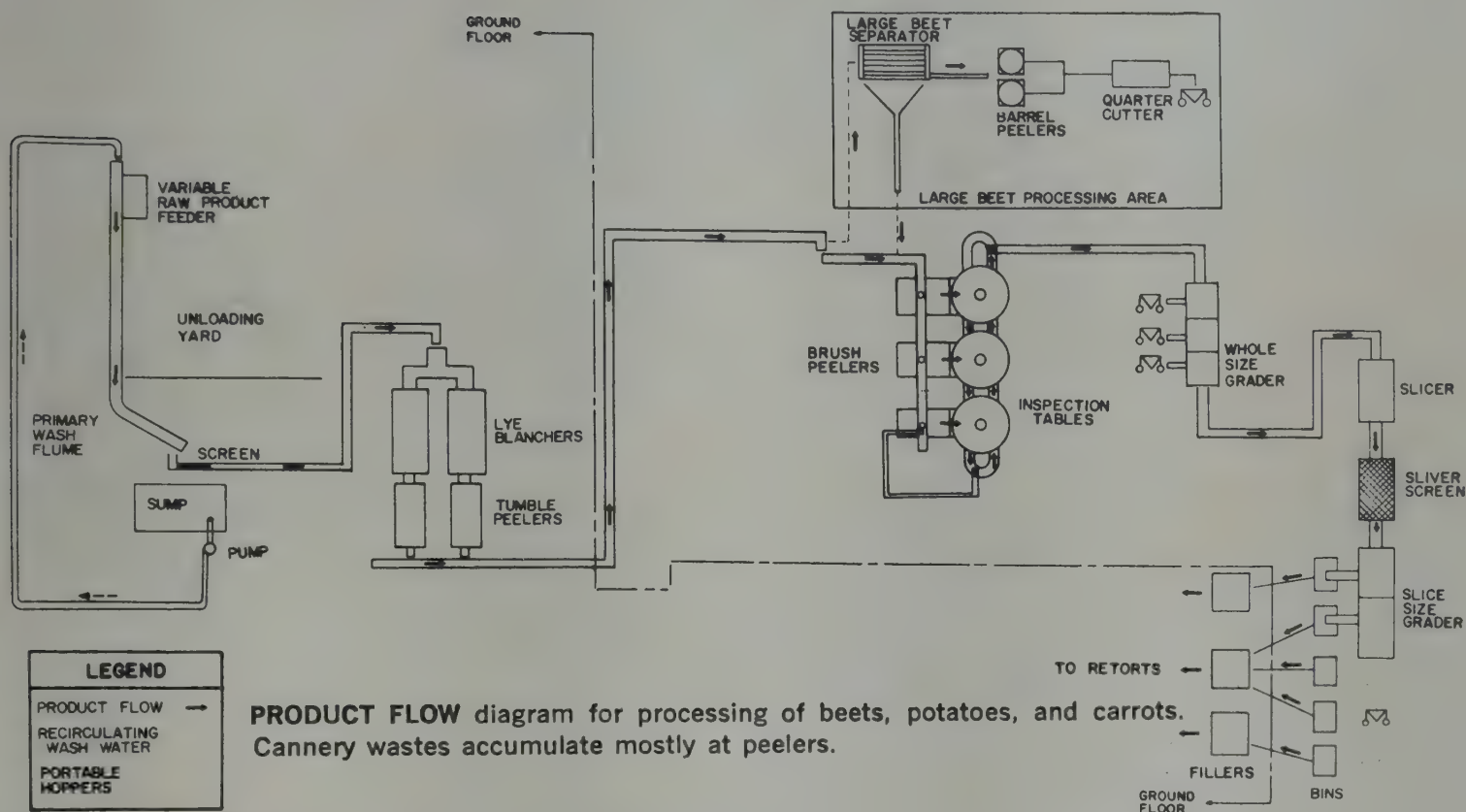
These products and Reliance distributor groups are now unified under Dodge management as an outgrowth of the merger of Dodge into Reliance. This gives Dodge the largest distributor organization ever mobilized to serve industry with mechanical power transmission equipment. And talk about drive equipment, if Dodge doesn't have it now, you probably don't need it.

Dodge Manufacturing Corporation, Division of Reliance Electric Co., 2800 Union St., Mishawaka, Indiana 46544



ADVANCES IN TECHNOLOGY

FE



Should Reduce Cannery Wastes

Vegetable cannery wastes result from processing a large variety of products, e.g., peas, corn, beets, potatoes and carrots. Wastes may be classified into two general groups: solid wastes, such as trimmings, peels, leaves, stems, and discarded vegetables; and

liquid wastes, i.e., sugars, starches, and other organic and mineral material leached from the vegetables. All these wastes create a serious disposal problem.

Reduction of wastes in vegetable canneries can be achieved in several ways. First, improve

design and operation of processing machinery. Second, reduce pollution loads. Third, reduce water utilization rates.—*College of Agricultural and Life Sciences, University of Wisconsin, June, 1968.* (Also, see FE, Aug. '68, pp. 92-95.)

Enriches Flavor of Butter Powder

An 80% fat powder gave the best results in home-baked recipes. It contains, as emulsifiers, 1.2% glyceryl lacto stearate and 3% protein, instead of 1.5% commercial glycerol monostearate and 8% protein used earlier in industrial formulations.

Acceptable cakes were made with this powder under home-baking conditions from a variety of recipes. Cakes baked with powder in a high fat recipe (20% fat contributed by the shortening) lacked some of the rich eat-

ing qualities of cakes made using butter improved as described here, above. However, when baked in a leaner recipe (17% fat), powder cakes equalled in quality to butter cakes. — *The Australian Jour. of Dairy Technology*, 23 (2), 85-89, 1968.

Estimating "Tea Creaming"

When black tea infusions cool down, "cream" is formed frequently when the tea is to be used as iced tea. Eventually, a colored precipitate forms and clouds up the tea. The "cream" components are chiefly theafla-

vins, thearubigins and caffeine, but there are also smaller amounts of other flavonoids, non-caffeine nitrogen compounds, chlorophyll and inorganic material.

You can estimate the "creaming power" of a tea by determining the soluble solids of the initial tea infusion (S_I) and of the tea infusion after cooling it and centrifuging off the "cream" (S_F), and applying the formula: $\text{Creaming power} = (S_I - S_F) / S_I \times 85 / S_I$.

In nine different samples of tea, the "creaming power" coefficient ranged from 0 (no cream) to



We turn sticky sanitation problems into a piece of cake

Wyandotte puts the heat on food plant sanitation problems with a hot batch of cleaning products designed to save you dough.

Products for power washing; soak cleaning; hand brushing; pan reconditioning; floor maintenance; fryer cleaning; sanitizing; and pressure spray, circulation and spray cleaning. We even have instruments for proper feeding and solution control. And your Wyandotte representative has the recipe to match the right products with your particular sanitation requirements.

Turn clean-up problems into a piece of cake by establishing a Wyandotte quality and cost controlled sanitation program. For a no-obligation survey, call or write us today. J. B. Ford Division, Wyandotte Chemicals Corporation, Wyandotte, Michigan 48192.

Wyandotte
CHEMICALS CORPORATION

Advances in Technology

15.5 (considerable amount of cream). The formula results agree reasonably well with visual observations of the ability to cream.—*Jour. of the Science of Food and Agriculture*, 19(9), 530-534, 1968.

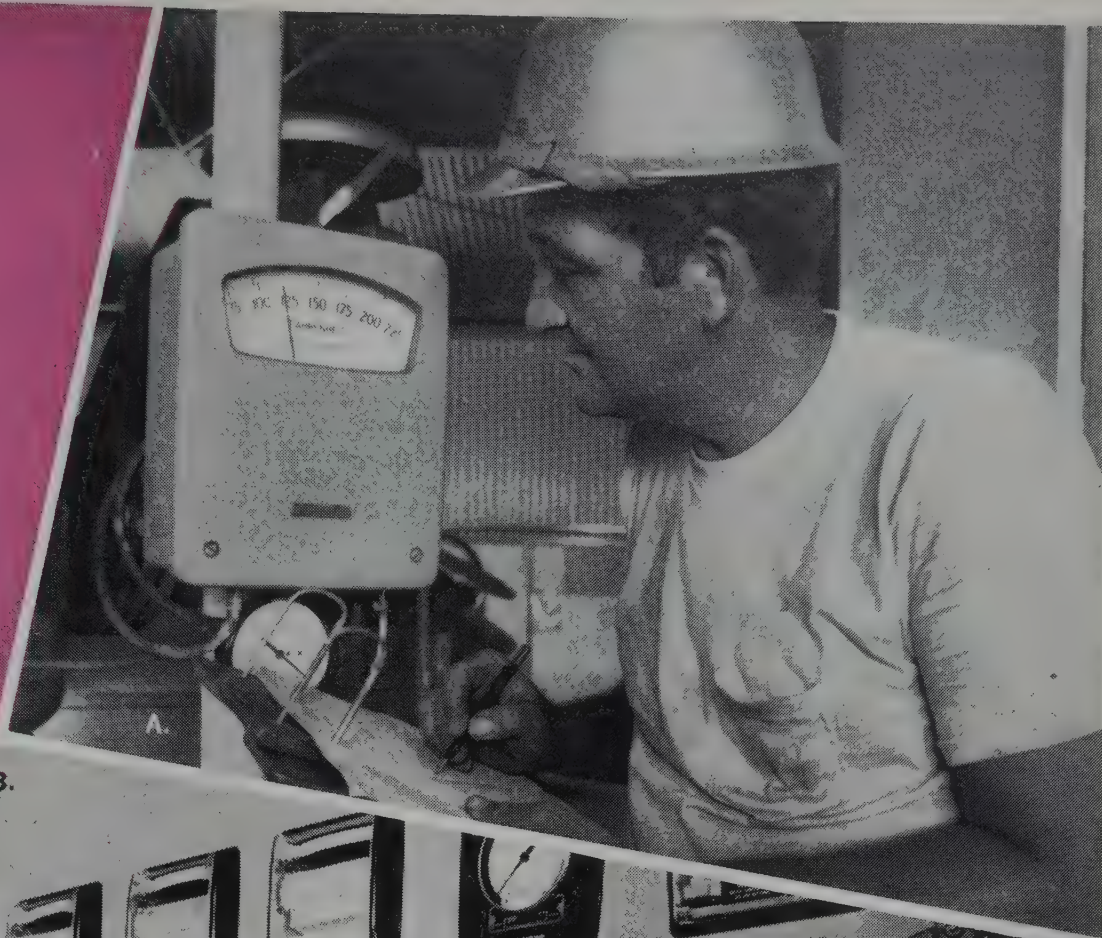
Non-heat Coagulable Eggs

Whole eggs or egg yolks are rendered non-heat coagulable, more stable to oxidation, readily water soluble, and enriched in egg flavor, by means of a mold enzyme hydrolysis. Treated products can be used as additives for baked food, baby food, noodles, prepared cake mixes, salad dressings, or new types of foods and drinks.

To carry out the hydrolysis, an aqueous extract of the enzymic systems can be prepared by cultivating the fungi, in the usual way, on a bran substrate. The fungi used belong to either the *Aspergillus*, *Penicillium* or *Mucor* species.

In practice, homogenized egg liquid is adjusted to the optimum pH range of 3.8 to 4.8, mixed with an aqueous solution of the enzymic systems, and incubated at a temperature of from 30C to 45C, for about 12 to 72 hours. After hydrolysis is completed, mixture is neutralized to pH 7, heated to 80C for 20 minutes to inactivate the enzymes, frozen, or treated with gum arabic, a particle coating agent, and spray-dried.

Note that the bitter taste is eliminated because the egg proteins are broken down mostly to polypeptides and very little to amino acids. In addition to improved flavor derived from partial protein hydrolysis, the enzymic system also converts, to a considerable extent, the fatty components, e.g., egg oils and phosphatides into enhanced flavor rich egg yolk-like substances.—*U.S. Patent 3,260,606*.



A. Worker checks temperature in yeast culture tank as indicated on a Foxboro indicating transmitter. B. Central control panel gives records and indications of critical production variables. Panel is modular and all units are easily serviced.

Hawaii's First Rum Distillery

Complete Foxboro control system captures right taste for Calvert's Leilani Hawaiian Rum

It takes accurate control to capture the distinctive Hawaiian taste of Leilani Rum.

And that's what the distillery has, with a centralized Foxboro pneumatic control system that enables an operator to keep his eye on all critical variables of the distilling process. Among them: temperatures of the yeast culture, and control of proof via

temperature control of vapors in the distillation column.

Complete Control. From the time filtered water and molasses pass through Foxboro magnetic flow meters to an in-line mixing device that produces the mash, through fractional distillation, all production variables are tightly controlled.

Foxboro provides a variety of instruments for distilleries. These

include: intrinsically safe electronic instrumentation (Underwriters' Laboratories, Inc. Listed); inexpensive reliable target flow meters; magnetic flow meters that can be applied to concentrated stillage. A nearby Foxboro Sales Engineer can help you achieve the results you want. Or, write for literature. The Foxboro Company, 3012 Neponset Avenue, Foxboro, Massachusetts 02035.

FOXBORO
REG. U.S. PAT. & TM. OFF.



Specialists in process and energy control

OFFICES IN PRINCIPAL CITIES. PLANTS IN U.S.A. • CANADA • MEXICO • ENGLAND • FRANCE • NETHERLANDS • JAPAN • AUSTRALIA

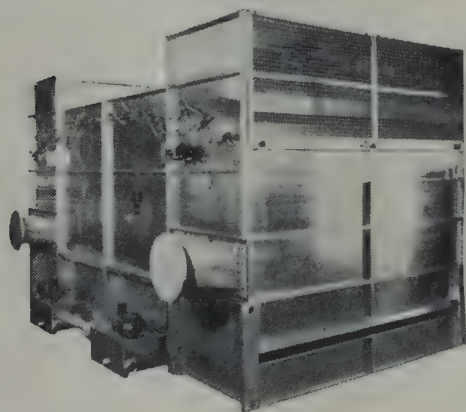


"NO-FROST"® REFRIGERATION GIVES REAL PROTECTION

Experienced operating men will tell you that Niagara No-Frost gives you best results in food freezing, cold storage protection, ice cream hardening and all refrigeration below freezing.

Especially in such tough conditions as meat packing and crop pre-cooling, where there are large amounts of moisture and extra air-borne causes of corrosion, No-Frost equipment out-lasts, out-performs and out-saves all other types.

Because it automatically PREVENTS all frost or ice formation from the start, Niagara No-Frost gives you always full capacity, prevents waste of power. You escape all trouble and labor of defrosting, have rooms that are always clean and sanitary, enjoy the lowest operating costs. Write for Bulletin 105.



SAVE POWER and CONDENSER WATER

NIAGARA Aero® VAPOR CONDENSER gives sustained full capacity, condensing vapors by evaporative cooling. You have no condensing water problem of supply, quality, disposal or temperature.

Liquids and vapors are always held at constant temperature under close control. You get uniform evaporator or distillation products the year round, better quality and increased production.

Non-condensibles are effectively separated and sub-cooled, giving you better vacuum pump operation, saving power and steam.

Standard units have capacities up to thirty million btu. Write for full information; ask for Bulletin 164.

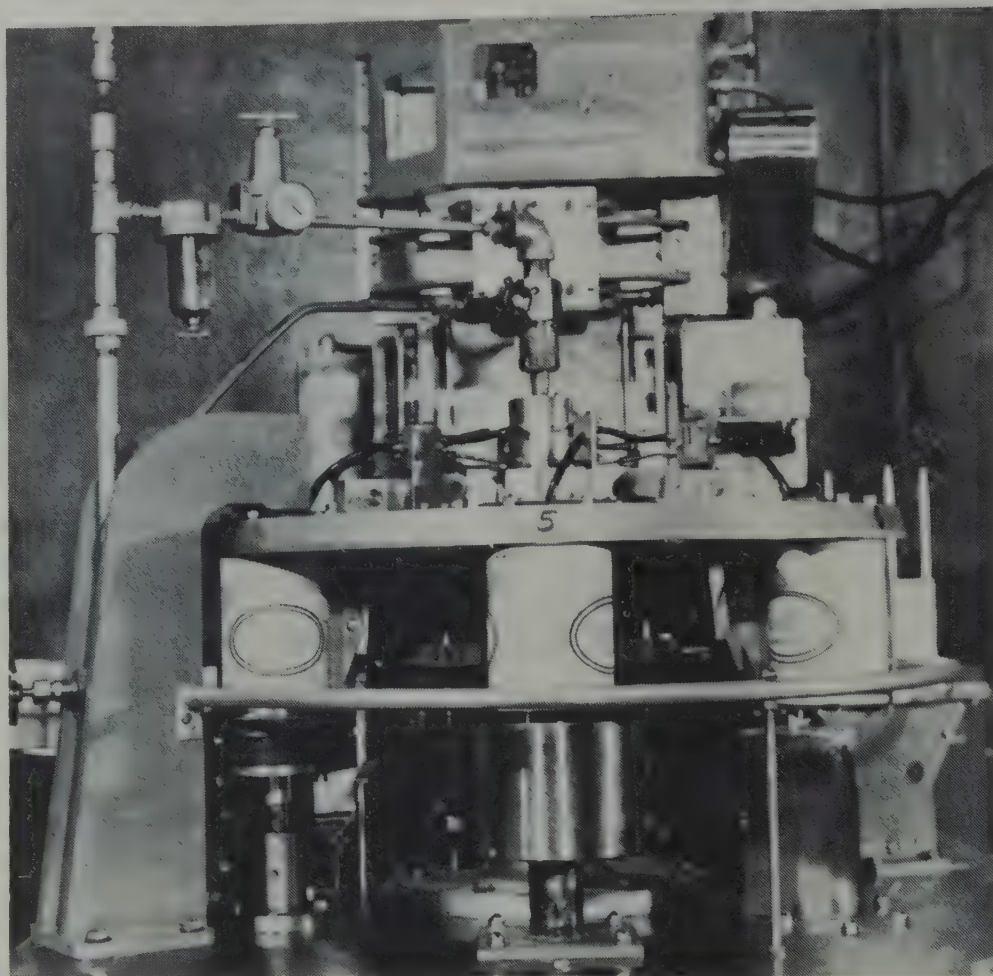
NIAGARA BLOWER COMPANY

Dept. FE-12, 405 Lexington Avenue
NEW YORK, N. Y. 10017

Over 40 years service in air engineering equipment.



NEWS SPOTLIGHT:



FORMING MACHINE, called Convocan 1/2-Gallon, turns out 34 cartons/min. Machine wraps PE-coated sidewall around mandrel and heat-seals edges, then inserts and heat-seals bottom disc.

MAKES PAPER CANS IN-PLANT

Continuous, automatic system
fabricates 1/2-gal round containers
from flat paper components

AN AUTOMATIC SYSTEM that produces cylindrical paper containers in-plant has been introduced by Sealright Co., Inc., Kansas City, Mo. System, called Convocan, comprises three easy-to-store carton components (sidewalls, bottoms and lids) and a machine to put them all together. Result is a liquid-tight container with the same plastic-welded seams used in Sealright's plastic-coated paper milk carton.

Used for Ice Cream

The convolute polyethylene-coated paper can was designed to compete with folded-box and spiral-wound containers. First reported use is by a California supermarket chain as a 1/2-gal ice cream container, but it also is suggested for snack foods, cereals, pet foods, cookies, candies, cake mixes and frozen vegetables.

Sealright supplies all the Con-



DESIGNED TO COMPETE with folded-box and spiral-wound containers, 1/2-gal ice cream containers are made in-plant by California packer. Paper can is formed from flat sidewalls and bottoms, capped with a prefabricated lid.

vocan carton components: PE-coated sidewalls and bottoms, plus covers (paperboard with solid top disc or plastic see-through window). The Convocan's flat sidewalls, bottoms and prefabricated tops can be stored in one-sixth the area required for regular round containers, Seal-right says, saving over 82% in shipping and warehousing space. It also provides considerable savings in freight charges.

The Convocan 1/2-Gallon machine has a production speed of 34 cartons/min, feeding a 900-gal/hr freezer and filler. It occupies a space of 45x59 in., with a maximum height of 89 in. One man can load and operate the machine, which has a built-in memory system. It shuts off automatically if any one of several manufacturing procedures is disturbed. In operation, machine feeds a PE-coated sidewall with heat-conditioned edges to a mandrel where it is wrapped, clamped and sealed. A bottom disc is then inserted into and heat-sealed to the sidewall. The top lid of the sidewall is beaded at another station, just before container conveys off to fillers.

Circle 362 on Inquiry Card




MIXER-BLENDER

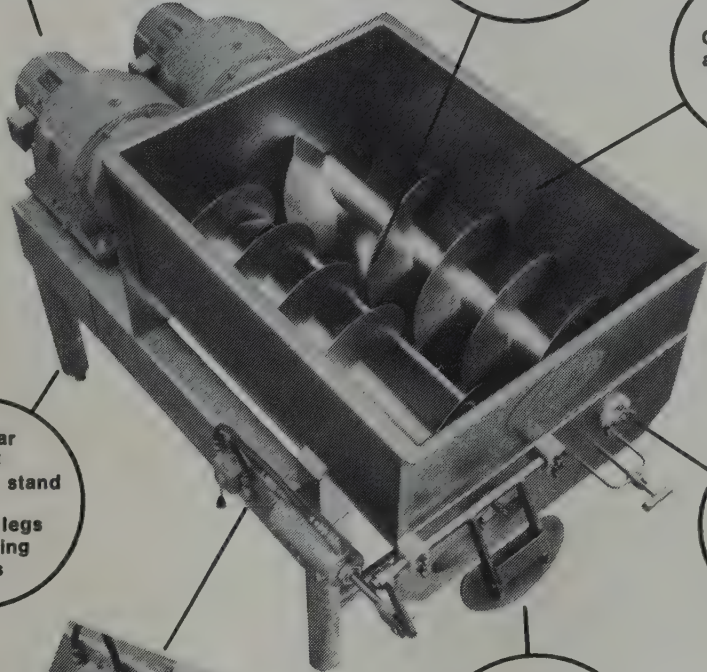
the "better answer"

to many mixing problems

Twin inline gear motor drives
Heavy duty rating

Twin screw design for most efficient mixing
Reversing screw for fast discharge

Crevice-free all stainless interior



Tubular steel galvanized stand
Leveling legs for sloping floors

Removable sanitary nylon block bearings

"Up front" operator control for all functions

"Swing-away" air operated product discharge door

CAPACITIES FROM 500 TO 15,000 LBS.

Jacketed Models Available for Cooking and Mixing

FULL INFORMATION FROM THESE RIETZ OFFICES

Santa Rosa, California (707) 545-2373
Chicago, Illinois (312) 764-4911
West Chester, Pennsylvania (215) 696-6313
Representatives in other principal cities



Equipment for: Size Reduction • Mixing
Heat Exchange • Pressing • Drying

MANUFACTURING COMPANY

Home Office and Plant: Santa Rosa, California 95402

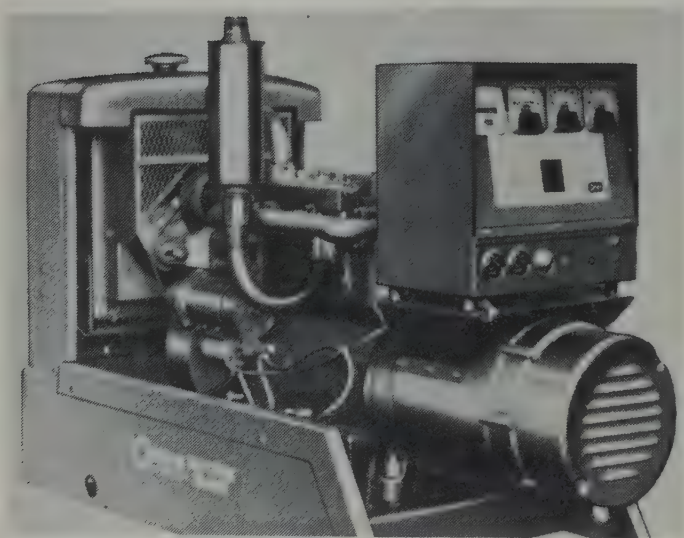
NEW EQUIPMENT AND SUPPLIES



Applies Sauce, Cheese to Pizza

Conveyorized, versatile pizza unit takes partially baked pizza shells through sauce and cheese dispensing stations at speeds to 200/min for 5-in. dia pies, 6 per row. Larger 10-in. pies are handled 2 per row at 50/min.

Indexed shells are spotted under sauce dispenser. Here positive displacement pump feeds revolving shower-type heads which spread sauce. At next station, auger-type feeder dispenses and evenly spreads chopped cheese to the shell.—*G. Diehl Mateer Co., Wayne, Pa.* Circle 291 on Inquiry Card

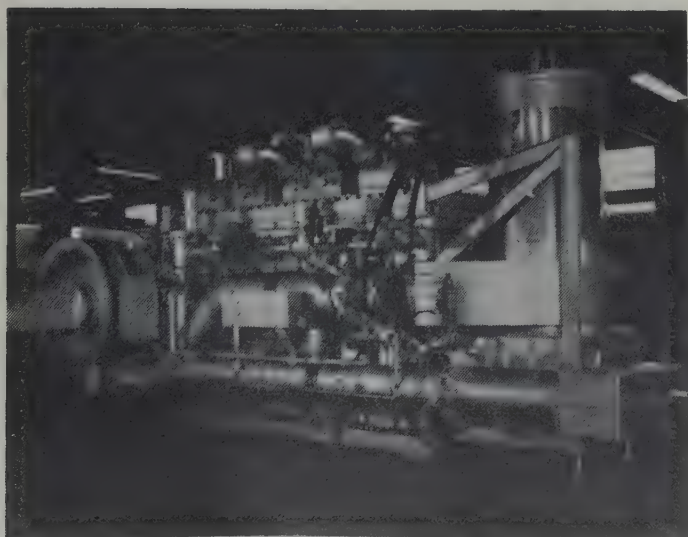


Power Plant Produces 17,500 Watts

Diesel driven generator has 17.5 kw standby or 15 kw continuous service capacity. Integrated, self-contained unit can be trailer mounted for interplant mobility.

Plant uses water cooled, 4-cycle, 4-cylinder vertical inline diesel. Engine features fast, easy maintenance. Alternator is of the revolving field, 4-pole type. Rotor is coupled to engine through a rigid, keyed and tapered coupling, and secured by draw bolt.—*ONAN Div., Studebaker Corp., Minneapolis, Minn.*

Circle 292 on Inquiry Card

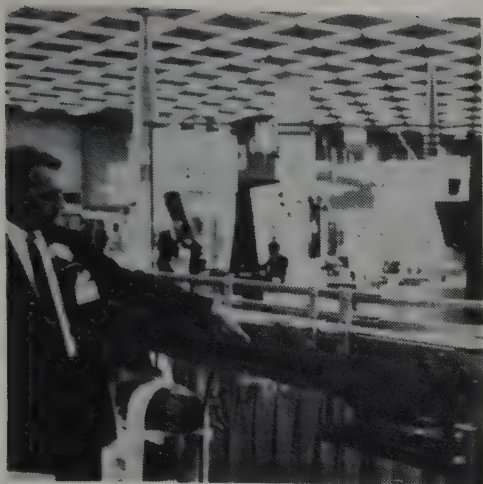


Heaters Offer Low Cost 1500F Air

Hot air heaters deliver preheated air with full capacity operations at temperatures to 1500F. Package unit offers reduced on-site construction cost, error, and waste. Scrubbing action of air and gas cleans heater.

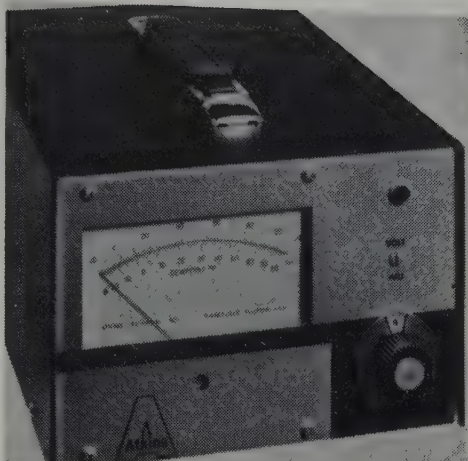
Only hot gases enter the heat exchanger section as combustion takes place in metal-encased chamber. Burner efficiencies give low heater exhaust temperatures of 350F to 450F. — *Fabricating Engineering Corp., York, Pa.* Circle 293 on Inquiry Card

For more data, circle item numbers on card at back of issue.



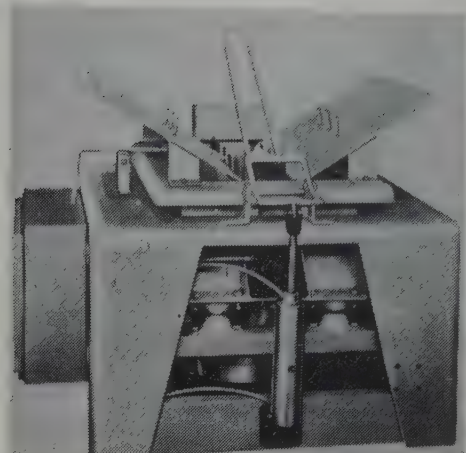
CONVEYOR offers sanitary collector pan which prevents dripping of detergent-type lubricant onto floor. Drip pan outlets feed into floor drains.—Taylor Mfg. Co., Inc., Salisbury, N.C.

Circle 294 on Inquiry Card



DEWPOINT probe principle is thermal nulling using hygroscopic salts. Knob selects air dewpoint or temperature scale reading but with low cost.—Atkins Technical Inc., Gainesville, Fla.

Circle 295 on Inquiry Card



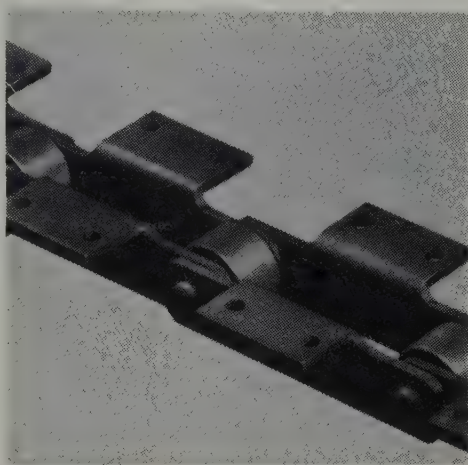
BAG EMPTYING unit handles powdered, pelletized, or granulated materials. Unit splits open bag, material empties into hopper, and bag is ejected.—Cherry-Burrell Corp., Claremont, Calif.

Circle 296 on Inquiry Card



PALLETIZER mates electronic controls with hydraulic power to arrange tiers from bottom up. Switch changes pallet patterns and tier heights.—Columbia Machine Co., Vancouver, Wash.

Circle 297 on Inquiry Card



CONVEYOR CHAINS have plastic-bushed rollers for operation in corrosive areas, where steam cleaning is necessary, and lubrication is undesirable.—Link-Belt Div., FMC Corp., Chicago.

Circle 298 on Inquiry Card



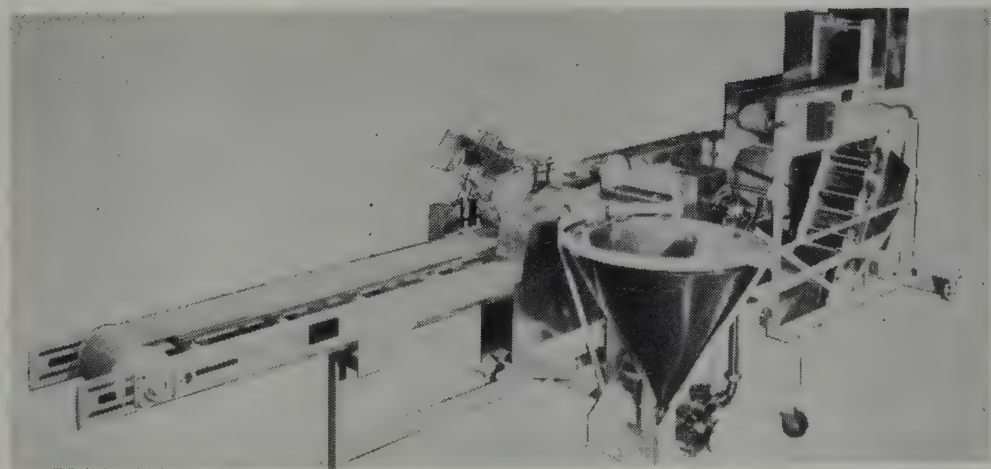
LINE COMBINER merges four lines into two, then one, each moving at double speed. Split drive allows conveyors to bring in containers with screws stopped.—Kinsley Corp., Trevese, Pa.

Circle 299 on Inquiry Card



STAND-UP, end-control electric truck has handle which controls travel and lifting. Unit turns in $48\frac{1}{2}$ in. circle, and has 3,000-lb capacity.—Eaton Yale & Towne, Inc., Philadelphia.

Circle 300 on Inquiry Card



PIES AND TURNOVERS at 7500 per hr are ready for frying, freezing, or baking. Sheeter produces continuous, uniform strip of pie dough. Filler deposits fruit filling at intervals on half of the dough strip. Unit then folds over the other half of the dough strip. And a revolving trimmer head seals, cuts out, and crimps the pie or turnover.—Colborne Mfg. Co., Chicago.

Circle 301 on Inquiry Card

TRY ILLÉS IMPERIAL CHOC-ESSENCE®

THE
PERFECT
CHOCOLATE
ACCENT
FOR

BAKERS

CANDY
MAKERS

DAIRIES

PHARMACEU-
TICALS



LIQUID OR POWDERED

Give your chocolate a new meaning. Illés CHOC-ESSENCE makes cocoa taste like the best chocolate liquor.

Widely used in: Cookies...
Cookie Filling... Cake...
Cake Icing... Chocolate
Cremes... Frozen Foods...
Ice Milk... Mellorine...
and Pharmaceuticals.

Now, tremendous demand
reduces cost! Write, wire or
phone for price schedule...
for liquid or powered samples.

Satisfaction
Guaranteed

A. E. ILLÉS COMPANY

Manufacturers of Finer Flavors

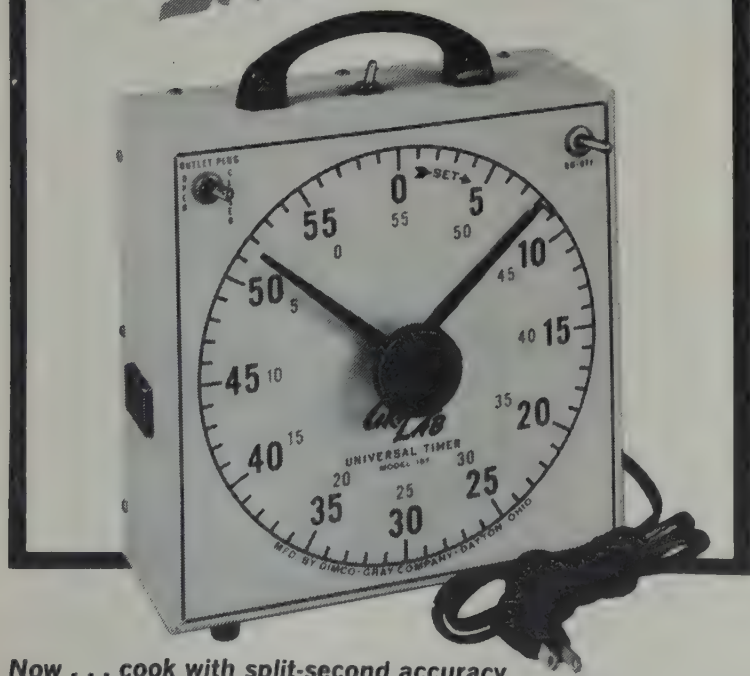
P. O. BOX 35412 • DALLAS, TEXAS 75235

AREA CODE 214 631-8350

Ask For Technical Bulletin

Circle 65 on Inquiry Card

GRA LAB TIMERS FOR FOOD PREPARATION



Now... cook with split-second accuracy
... time baking, cooking, toasting, mixing, frying, broiling.
Large 8" dial. 60 minute time range can be set in minutes
and seconds. Buzzer alarm signals end of interval. Outlet
receptacle automatically switches small appliances (up to
750 watts) on or off. Semi-gloss white finish, easy to wipe
clean. Carrying handle. Write for catalog.

DIMCO-GRAY COMPANY

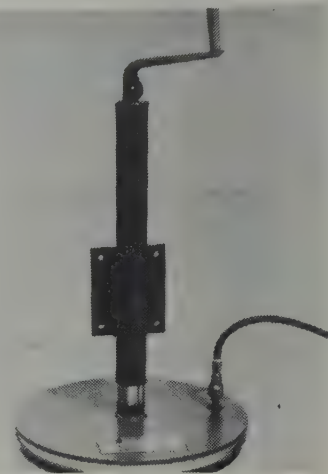
207 E. Sixth St., Dayton, Ohio 45402

Circle 66 on Inquiry Card

New Equipment & Supplies

AIR BEARING caster
allows lifting and lower-
ing of heavy loads. And
then pushing or pulling
the load over a friction-
less air layer. Caster
jack requires 1-lb push
to move 1000 lb load.—
Transocean Air Systems
Corp., Goleta, Calif.

Circle 302 on Inquiry Card



HOPPER with 1½-cu yd
capacity is self-dump-
ing and stackable. Unit
fits forks of lift truck
or has iron or rubber
wheel casters. Driver
operates release lock
from seat to empty and
automatically reset hop-
per.—Lodi-Fab Indus-
tries, Lodi, Calif.

Circle 303 on Inquiry Card



DAMPERS offer precise
air control for environ-
mental chambers, recir-
culating ovens, furnaces,
and process air flow.
Units shut tight and
hold air leakage under
3% at velocities to 1500
fpm.—Honeywell, Appa-
ratus Controls Div., Min-
neapolis, Minn.

Circle 304 on Inquiry Card



FILTER CHAMBERS are
acid resistant and pro-
vide non-metallic solu-
tion contact with the
liquid or gas being fil-
tered. Internal compo-
nents of the steel vessel
are a Penton coating or
molded polyethylene.—
Service Filtration Corp.,
Chicago.

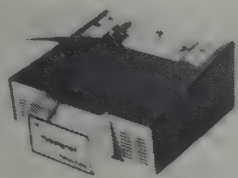
Circle 305 on Inquiry Card



STEAM TRAP for use
with food processing
equipment features a
replaceable seat which
can be removed without
disconnecting either in-
let or outlet pipes. Only
moving part in unit is
disc.—American Air Fil-
ter Co., Inc., Louisville,
Ky.

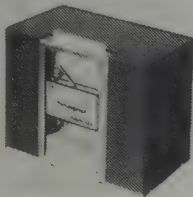
Circle 306 on Inquiry Card





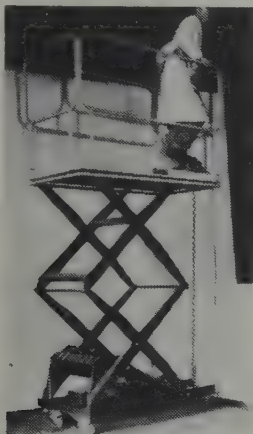
TELESCRIBER permits transmission of hand-written messages to unattended receivers via telephone lines or microwave. Ball point pen writes on special forms or plain roll paper with multiple copies available. — Telautograph Corp., Los Angeles.

Circle 307 on Inquiry Card

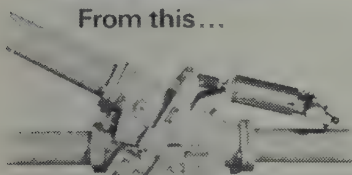


DOUBLE SCISSOR lift is available in 1000- and 2000-lb capacity. Platform travel goes to 104 in. Power pack with oversized reservoir allows inching up at 20 operations per min. Unit is foot operated. — Motion Inc., Franklin Park, Ill.

Circle 308 on Inquiry Card



From this...



to this



in minutes without removing from line

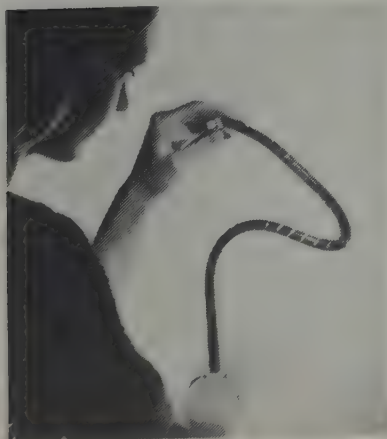
LINE DIVERTER for positive-pressure pneumatic conveying systems is air-tight, and dust-free. All moving parts are easily removed for inspection without removing the diverter from the conveyor line. — The Buhler Corp., Minneapolis, Minn.

Circle 309 on Inquiry Card



STOCK PICKER has 2,500-lb capacity. Unit features lifting heights from 102-in. to 146-in. Hand control regulates travel direction, speed, raising, and lowering. Deadman pedal controls braking. — Crown Controls Corp., New Bremen, Ohio.

Circle 310 on Inquiry Card



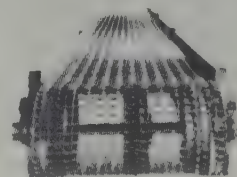
LIGHT TUBE consists of 625 plastic fibers with a $\frac{1}{4}$ in. by $\frac{1}{4}$ in. image. Fibers divide image into dots of light and carry dot in exact arrangement to other end of the tube for half-tone resolution. — Van Deusen Co., Laguna Beach, Calif.

Circle 311 on Inquiry Card

Some days just aren't right for making conveyor belts

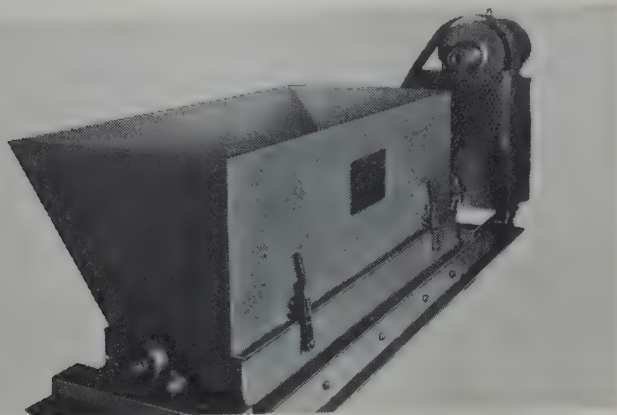


■ You feel it out here in La Porte, Indiana. Every so often a day will come along where you'll know right off in the morning. You'll hear a happy bird . . . catch a real nice breeze . . . see a couple of barefoot kids with bamboo poles heading for the creek . . . And it comes to you that today's batch of open mesh flexible steel belting just won't be right. It'll lack the priceless La Porte ingredient—heart. City folks may scoff at the idea, but heart is mighty important to the Hacker boys. When their dad, Mr. John, got the business going close on fifty-five years ago, he did it on a good idea and a lot of heart. Oh, there's other names for it now, like "quality control" and such, but the boys still think of it the way their dad did. Mr. Jim and young Mr. John put all their time and energy into producing the very best conveyor belting. Some customers don't know about the heart in those belts, but they get it all the same. And on a day when a feller's heart just has to be somewhere else . . . well that's a good day to close the plant. Easy enough here in the country. Too bad city belters can't do the same.



La Porte MAT. & MFG. CO.
BOX 124, DEPT. F • LA PORTE, INDIANA 46350

New Equipment & Supplies



SIZING MACHINE has baffle which directs flow of material mix to activator—a rotating shaft with alternating brushes and wipers that contact a circular half screen. Action forces material through screen into receiving hopper.—Posey Iron Works, Inc., Lancaster, Pa.

Circle 312 on Inquiry Card

IMPACTOR provides any impact cycle ranging from one stroke every 5 sec. to one every hour. Unit consists of piston-type vibrator coupled with an electric control box.—Cleveland Vibrator Co., Cleveland, Ohio.

Circle 313 on Inquiry Card

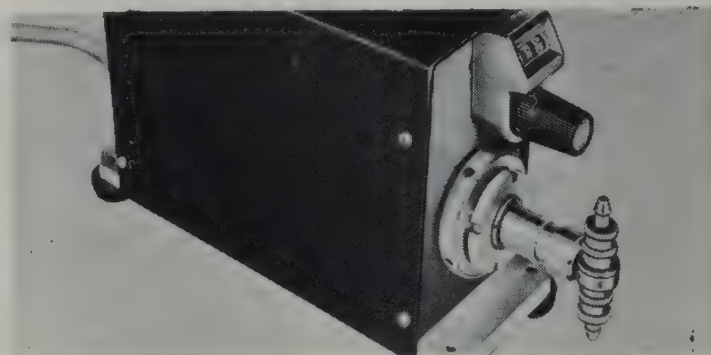
INERTIA SWITCH provides vibration and shock protection for rotating or reciprocating equipment. Unit actuates and latches switch if vibration exceeds predetermined set point.—Metrix Instrument Co., Houston, Tex.

Circle 314 on Inquiry Card



CONVEYOR CHAIN of Delrin is available in widths of 7½-, 10-, and 12-in. Chain features close hinge design and stainless steel rivets.—Rex Chainbelt Inc., Milwaukee, Wis.

Circle 315 on Inquiry Card



METERING PUMP offers accurate repetitious pipetting, injecting and dispensing of fluids in response to remote on-off switching. Digital display indicates dispensed volume.—Harvard Apparatus Co., Inc., Millis, Mass.

Circle 316 on Inquiry Card

National Exposition for Food Processors®

Civic Center • Jan. 19-22, 1969

Emphasis on production—NEFP is the whole Food Processing Industry under one roof. The equipment, the techniques, the supplies . . . the keys to profitable operations on display down every aisle. If it's new you'll find it here. And most often you'll find it here first. That's why year after year, Food Processors consider these to be the four most important days in the Food Processing Industry. NEFP is held annually during the Canners Convention. There are no registration fees for qualified Processors to attend the Exposition. Write for details.

FOOD PROCESSING MACHINERY & SUPPLIES ASSOCIATION



7758 Wisconsin Avenue, N.W., Washington 20014

SAN FRANCISCO

**Old boilers
are expensive.**

**Let the
Kewanee Crew
build a
little extra
quality
into your
new one.**

Breakdowns always seem to happen when you need the boiler the most. Probably that's because it has to be pushed to capacity for lengthy periods of time. Odds are, that old boiler may even be a Kewanee, since we have more boiler units still in service than any two competitors combined. Which says something for Kewanee dependability.

We've been designing and building heat generating equipment for 100 years, and still believe in pride and workmanship in boiler manufacturing. That's why the Kewanee Crew builds a little extra quality into our product, to assure all the real fuel saving economy and low-cost maintenance for which Kewanee boilers have always been famous. Our packaged boiler design also means minimal space requirements.

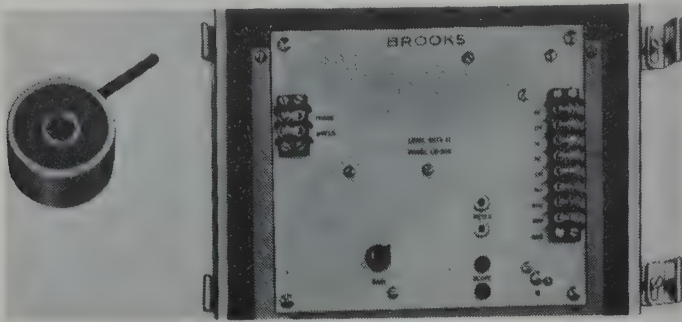
If you get a little nervous every time your old boiler starts getting a good workout, contact your local American-Standard Kewanee sales representative; or write us directly for more information on our complete line of firebox and scotch boiler units. It may save you a lot of money in the long run.



HEAT TRANSFER PRODUCTS DEPT.
DETROIT, MICH. 48232

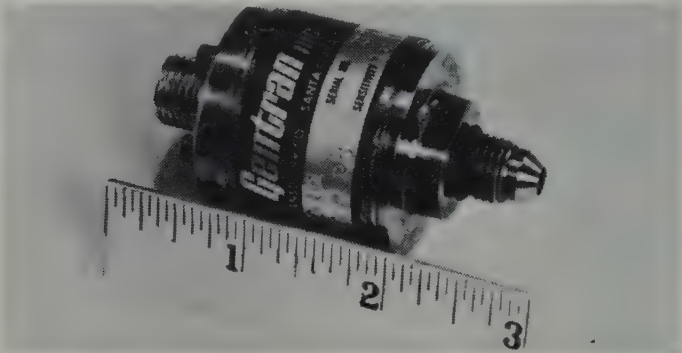


New Equipment & Supplies



LIQUID LEVEL system mounts on external wall of vessel. Transducer does not touch liquid. Unit works on sonar principles.—Brooks Instrument Div., Emerson Electric Co., Hatfield, Pa.

Circle 317 on Inquiry Card



STRAIN GAGE pressure transducer offers 1-v output, shock-resistant construction, and sealed stainless steel housing.—Gentran, Inc., Santa Clara, Calif.

Circle 318 on Inquiry Card

DOCK RAMP attaches to existing dock by welding without chopping out dock floor or wall.—Service Steel & Engineering, Niagara Falls, N.Y.

Circle 319 on Inquiry Card

CARGO HEATER for truck bodies uses propane fuel, and battery powered air circulator. Rating is 30,000 btu/hr.—Hunter Manufacturing Co., Solon, Ohio.

Circle 320 on Inquiry Card

ROTARY BLOWERS feature new lubrication system and detachable mounting feet which make it possible to install on either a horizontal or vertical surface.—Dresser Industries, Inc., Olean, N. Y.

Circle 321 on Inquiry Card

AGITATOR BOOTS of Teflon are heat shrunk onto agitator in field by means of industrial hot air gun.—Fluorodynamics, Inc., Newark, Del.

Circle 322 on Inquiry Card

SHALLOW BAKERY boxes feature slide-away balls which permit stacking under full loads. Boxes nest 80% when empty.—Hollywood Plastics, Inc., Los Angeles.

Circle 323 on Inquiry Card

HEATING ELEMENT either has sheath of aluminum, aluminized steel or other material to allow greater conductive area.—Acra Electric Corp., Schiller Park, Ill.

Circle 324 on Inquiry Card

TEFLON TUBING for roll covers provides anti-stick character and offers resistance to corrosion.—Zeus Industrial Products, Inc., Princeton, N. J.

Circle 325 on Inquiry Card

The world market for the packaging and confectionery industry



5th International Fair
for Packaging Machinery,
Packaging Materials,
Confectionery Machinery

For information, room reservation
forms and admission tickets contact:

**GERMAN AMERICAN
CHAMBER OF COMMERCE**

666 Fifth Avenue
New York, N.Y. 10019
(212) 582-7788

77 E. Monroe Street
Chicago, Ill. 60603
(312) 782-8557

Interpack Düsseldorf May 10-16, 1969

Circle 70 on Inquiry Card

PLASTIC FLOOR GROUT

for new installations and regrouting

A new epoxy cement for new floors or regrouting old, eroded joints. Can be applied at end of one day . . . ready for use next morning. Acid proof . . . chemically resistant . . . easy to apply . . . best adhesive quality available . . . will not shrink. Your maintenance men can apply it. Comes in gray, red and black.

(complete unit)

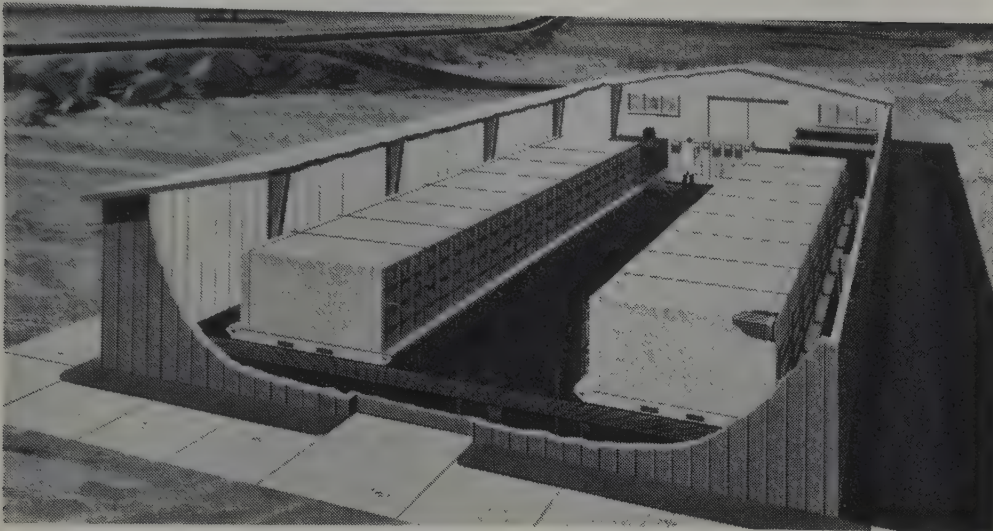
Write for free literature or trial order
OUR 99th YEAR 1869-1968

DREHMANN PAVING & FLOORING CO.

2101 Byberry Road

Philadelphia, Pa. 19116





TYPICAL DESALTING INSTALLATION, this plant is designed to produce 200,000 gal of pure water daily. System comprises reverse-osmosis modules arranged in series.

REVERSE OSMOSIS PURIFIES WATER

Modular system makes brackish water potable. Equipment, operating costs low.

NEW REVERSE OSMOSIS water-desalting system called Acro Pac produces 36,000 gal of fresh water per day for heating, processing, or generating electric power. System removes 90-95% of dissolved salts while rejecting particulate matter, organics, bacteria, and detergents.

Water containing 2,000 ppm total solids can be purified to less than 200 ppm with 6-9 kw-hr of energy per 1,000 gal. And a typical 10,000-gal/day brackish water conversion plant, selling for about \$15,000, is said to cost less than 50¢/1,000 gal to operate.

The basic unit comprises membrane modules and a pressure pump. The membrane material is contained inside a ½-in. I. D. plastic tube. The tubular design promotes a turbulent feedwater flow which cleans the surface of

the membrane, minimizing salt buildup and fouling by particulate matter. Several such tubes are combined in a header to form a module.

The unit can handle water containing up to 10,000 ppm dissolved solids. Standard modular packaged plants range from 1,000 up to 1,000,000 gal/day. Larger capacities, are available to meet specific requirements.

System's large-tube design permits convenient, inexpensive membrane replacement without special tools. The cellulose acetate membrane is cast inside a disposable paper tube that slides into the plastic outer tube. Replacement tubes cost as little as 50¢ each. Membrane life, depending on type of feedwater, is six months to three years.—*Aqua-Chem, Inc., Milwaukee.*

Circle 363 on Inquiry Card

*If you have
a product
which you must*

- ☐ Mix
- ☐ Blend
- ☐ Convey
- ☐ Scalp
- ☐ Screen
- ☐ Granulate
- ☐ Reduce
- ☐ Size
- ☐ Classify
- ☐ Cut
- ☐ Mill
- ☐ Clean
- ☐ Scour
- ☐ Sift
- ☐ Aspirate
- ☐ Pack
- ☐ Bag
- ☐ Weigh
- ☐ Elevate

then...

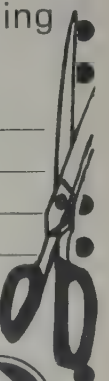
S. Howes has a machine that will do the job. Check the appropriate box, attach your specifications. Fill out the coupon below, and mail the whole ad to S. Howes. We will show you how we can solve your problem... S. Howes, in business for 112 years, is a one-source supply for reliable processing machinery.

Name _____
Street _____
City _____
State _____ Zip _____

S. HOWES CO., INC.

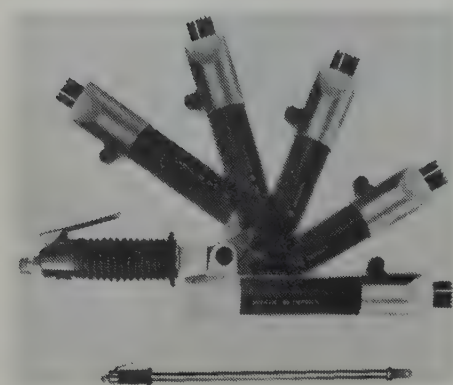
1940 Miller St.,
Silver Creek, N. Y. 14136

specialists in processing
and handling equipment
since 1856





NEW FOR SANITATION AND MAINTENANCE



Cleans Confined Places

An improved type of needle gun adjusts automatically to surface irregularities, crevices, rivet and bolt heads, to remove old paint, rust, scale, weld slag and hardened deposits.

A unique feature of this model, called MINI-SCALER is a handle that may be positioned at any

angle to clean around corners, inside pipes, and other hard to get at places. Further, special extension bars permit the gun to be extended several feet for overhead work on beams, ceilings, and other structural cleaning.—*The Marindus Co., Inc., Englewood, N.J.* Circle 276 on Inquiry Card

TEFLON PLASTIC PACKING

. . . A self-lubricating, chemical resistant mechanical packing, called Flexrock 403, is an extrusion of a special solid Teflon compound with a desirable lubricant. The packing responds readily to adjustment. It is serviceable from -90F to 500F and is an effective seal for dynamic or static applications. — *Flexrock Co., Philadelphia, Pa.*

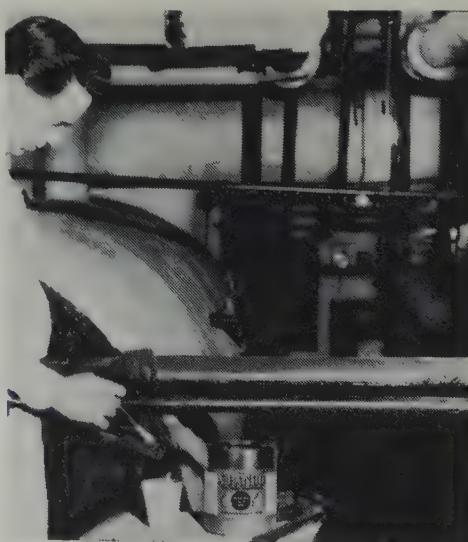
Circle 277 on Inquiry Card

Offers Foot Comfort

A new type of 100% vinyl cushioned foot mat is made with a firm cushioning vinyl core containing millions of air bubbles. It resists greases, oils, alcohol and most liquids.

Named Foot Lover Anti-Fatigue Mat, it insures foot comfort which improves worker morale, reduces mistakes and curbs absenteeism. Further, it also reduces foot, leg and back fatigue of industrial workers, file clerks, business machine operators, cooks, cashiers, bank tellers, dentists—in fact, everyone who stands while working.—*Crown Rubber Co., Fremont, Ohio.*

Circle 278 on Inquiry Card



PIPE JOINT COMPOUND (X-Pando) can deliver a permanent joining when temperatures ranging from -50F, to 2,000F and pressures of 6,000 psi are used.

The pipe joint compound can be used for all pipes, except aluminum, regardless of whether they carry noncorrosive gases, fluids or superheated steam. Since it is nontoxic, it may be used on pipes carrying food products.—*X-Pando Corp., Long Island City, N.Y.*

Circle 279 on Inquiry Card

Low cost feeder for your food ingredients



Wide range of standard accessories adapts basic OMEGA helix feeder to food processes involving free-flowing, floodable, cohesive, light or dense materials.

Performance proved on ingredients such as:

Barley	Milk Powder
Citric Acid	Salt
Flour	Starch
Gelatin	Sugar
Ground Coffee	Stabilizers
Guar	Vitamins

Simple, in-motion manual feed rate adjustment or automatic control capability to match your systems need. Capacities from 0.03 to 100 cu. ft./hr.

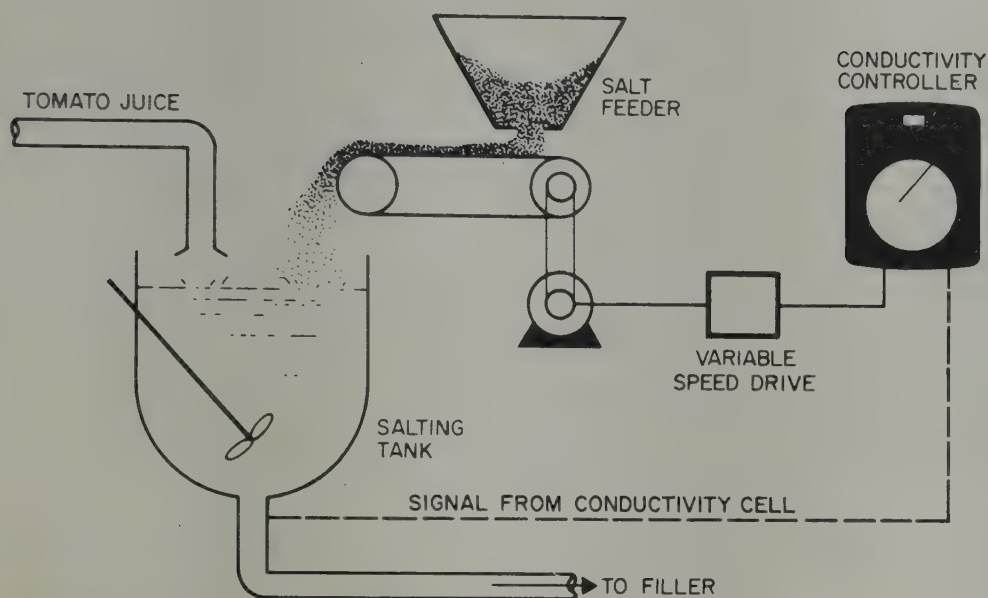
Accuracy within $\pm 1\%$ or 2% of set rate. Easily installed. Easily cleaned. Easily maintained.

For a better way to feed ingredients, write BIF A Unit of General Signal Corporation, 345 Harris Ave., Providence, R.I. 02901 Tel: 401-421-4302

BIF

A UNIT OF GENERAL SIGNAL CORPORATION





CONTROL LOOP for regulating salting of tomato juice has conductivity cell at outlet of salting tank. Deviation from set-point causes controller to take corrective action. Pneumatic output signal positions feeder variable speed drive to increase or decrease flow of salt.

CONTROLS SALTING OF PUREES, JUICES

Instrument measures conductivity and slows or speeds salt feeder as required

IN MOST PUREES, juices, and cereal slurries, salt content can be determined by measuring conductivity. The conductance of a product depends upon its base conductivity (acids, bases, and salts inherent to the initial raw material), concentration of added sodium chloride, and temperature. A wide range of receiving instruments is available to indicate, record, or control conductivity.

A typical in-line salt monitor-

ing system consists of a recording instrument and conductivity cell. The recording instrument may contain alarm contacts which are connected to the measurement pen and are individually adjustable. An excess or deficiency of salt energizes audible and visual alarms to alert the operator. For automatic regulation, the conductivity cell actuates a controller that adjusts the speed of the salt feeder when conductivity deviates from the set-point.

This article is from paper, "Monitoring and Control of Salt Content of Purees and Juices," by E. P. Nobrega, which will appear in ISA Conference Proceedings, "Advances in Instrumentation," Volume 23, Part I.—The Editors



BULLBOATING

The bullboat, an Indian invention, was made with tough buffalo skins stretched over a willow frame.

In the fall of 1824, Jim Bridger, the West's famous mountain man, floated in a bullboat down the unexplored Bear River in what is now Box Elder County, Utah. Flocks of waterfowl rose in thunderous waves as he entered a large bay. Cupping his hand, he reached over the side of the boat for a drink. "Hell, it's an arm of the Pacific," he exclaimed, spitting out the brine in disgust. The Great Salt Lake had been discovered.

The Great Salt Lake has long been known to contain a wealth of important minerals. Recently, new discoveries have been made and now technology exists to mine the lake's wealth. **Chemical Week** magazine has reported:

Utah has great potential for growth. As a kind of 'breadbasket' for chemical production the state may well be a main support for the nation's industrial expansion.

Box Elder County provides an atmosphere for growth. There is no civil unrest here; taxes are lower; freeway, railroad and air transportation reaches all of the West. Utah contains a wider variety of industrial raw materials than any other comparable known area. Our free-port laws are designed to attract manufacturers. An educated labor market and abundant water, land, and power make Box Elder County a prime location for light, specialized manufacturing operations.

.....

Box Elder County Industrial Commission
142C South Main Street
Brigham City, Utah 84302
Telephone 801-723-7377

Please send me detailed information on:

☐ taxes ☐ labor ☐ recreation ☐ other

Company _____

Address _____

City/State/Zip _____

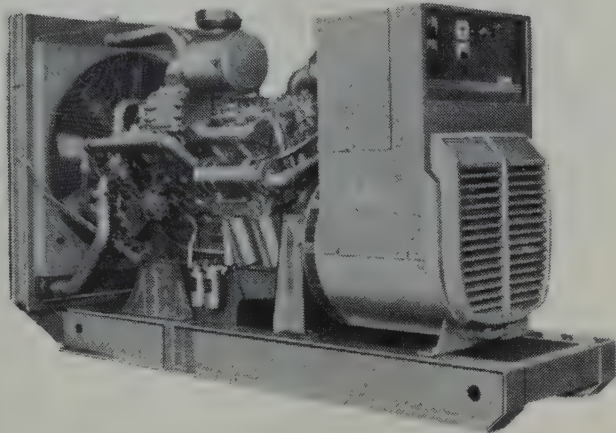
Your Name and Position _____

.....

Or Utah Industrial Promotion Board,
State Capitol / Salt Lake City, Utah

JUST OFF THE PRESS

PLANT ENGINEERING



STANDBY POWER. Illustrates latest additions to growing line of emergency generating equipment. Lists all essential engine and alternator data on four different electric plants. 4p—Onan, A Division of Studebaker Corp., Minneapolis, Minn. (Circle 401)

PINT-SIZED POWERHOUSE. Details compact diaphragm control valve that does a giant-sized job in controlling water, steam, gas, vacuum, etc. Bellows sealed for lifetime protection against stem leakage.—* Robertshaw Controls Co., Fulton Sylphon Division, Knoxville, Tenn. (Circle 402)

EASY-TO-CLEAN PUMP. Describes sanitary pump designed for fast, easy take-down without tools. Available in five models, units can be cleaned in-place by remote control without dismantling. 40p—* Ladish Co., Tri-Clover Division, Kenosha, Wis. (Circle 403)

CENTRIFUGAL COMPRESSOR. Features flexible-blade centrifugal gas compressor designed for large volumes at low pressures. Has wide range of industrial applications for concentrating, distilling, vaporizing, etc. 4p—Fairbanks Morse Water Processes Section, Colt Industries, Beloit, Wis. (Circle 404)

HIGH-PERFORMANCE PUMP. Tells why design simplicity permits new economy levels in high-performance, leak-proof hydraulic diaphragm pumps. Units have broad use, easily adapt to automatic processes. 6p—BIF A Unit of General Signal Corp., Providence, R. I. (Circle 411)

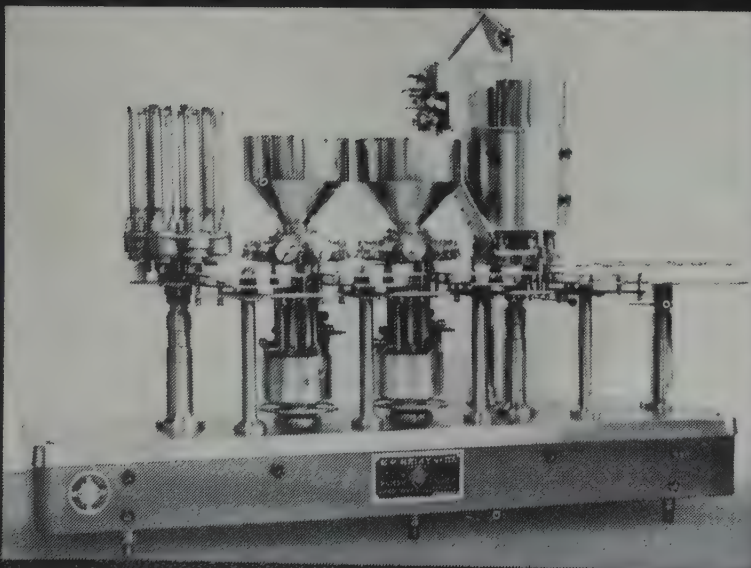
WATER SOFTENERS. Provides comprehensive guide to selection of industrial and municipal water softening equipment. Contains data and performance ranges from single units to complete systems.—Calfilco, Burlingame, Calif. (Circle 412)

NEW TURBINE DESIGN. Reviews single-stage, axial-flow, mechanical drive turbine with specs and dimensions. Unit is a small, inexpensive drive for process pumps, other constant-speed rotating equipment. 4p—Turbine Division, Skinner Engine Co., Erie, Pa. (Circle 413)

CANNED PUMPS. Details in-line regenerative canned pumps which combine simplified installation with chem-pump performance. Elimination of mechanical seals means less chance for failure, less need for maintenance. 4p—Roy E. Roth Co., Turbine Pump Division, Rock Island, Ill. (Circle 414)

*From advertisement in this issue

INCREASE THE RANGE OF YOUR PRODUCTIONS WITH THE REMY TYPE 50 VOLUMETER



- Great flexibility of use. Modifications or later complementary changes are possible when desired. Designed for a wide range of products - Single or combined ones, homogeneous or heterogeneous, going from the traditional type of yoghurt to the most complicated products.
- Can handle any type of cup from the tapered shaped ones to the cups with a wide neck, in paper or plastic and in a wide range of capacities.
- Allows different types of capping : crimping, heat sealing of an aluminium cap and even both operations if desired.
- Sanitary design special for dairies conditions of work.
- Volumetric filling by positive pumps.
- Two main types of machines with outputs of 6.000 and 12.000 cups/hour.



SOCIÉTÉ E. P. REMY et CIE, 50, AV. DES FENOTS - 28 - DREUX - FRANCE - TÉL. 46 09 63

WHATEVER THE SHAPE... WE'VE GOT THE SHADE



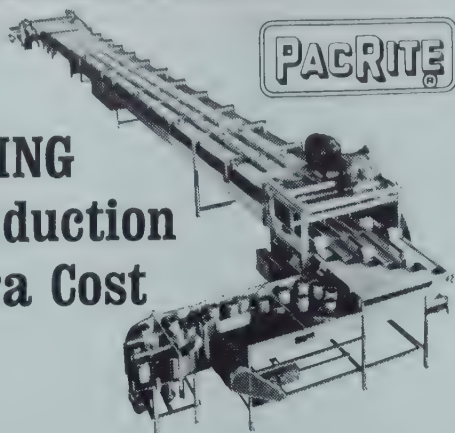
Puffed, popped or plain. Almost any snack food can use the natural-like, pure, consistent colors that Roche carotenoids provide. Identical to the forms found in cereals, eggs, carrots and oranges, Roche Beta Carotene and Apo Carotenal produce far more natural shades of red, orange and yellow than do the certified color additives. And they're nutritious, too.

Both are pro-vitamin A. So often you can make a vitamin A claim on your label. You can add them in suspension to shortening and/or cooking oils, or disperse them as beadlets in water and mix them with your product after it's processed. Either way, Roche carotenoids compensate for color loss during

cooking—ensure color stability in the finished product. You can order them as "Apo" alone, as "Beta" alone, or as a mixture blended to your specifications. And in each case we'll be glad to ship in convenient batch-size cans. Call your Roche Representative, or write Technical Services, Roche Chemical Division, Hoffmann-La Roche Inc., Nutley, New Jersey 07110.



SPIN COOLING Boosts Production at No Extra Cost



That's right! Faster, controlled cooling insures maximum production at lowest unit cost. An additional plus with PacRite Spin Cooling for protection of product texture and quality, and prevention of stackburn.

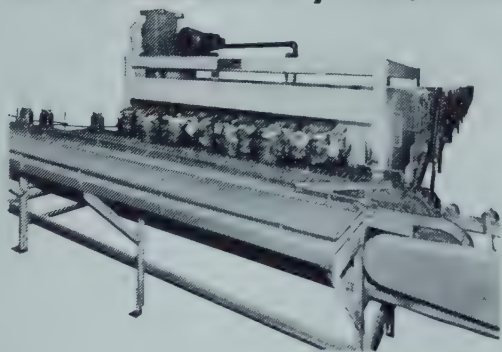
Get all the details today.

BULK BOX HANDLING SYSTEMS



PacRite Bulk Box Handling Systems are available in a wide capacity range with either automatic or semi-automatic controls. Each system of de-stacking, dump and restacking is engineered to match your installation requirements and provide maximum labor savings. Send for our new illustrated brochure.

PASTEURIZER / COOLERS



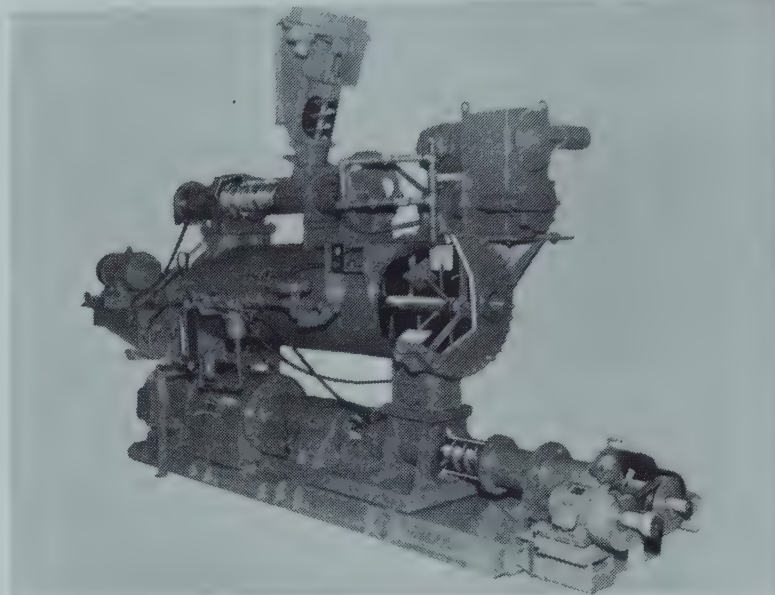
Here, tomorrow's ideas are engineered into today's PacRite Pasteurizers and Spray Coolers. Unique steam seals, water recirculation systems and other cost saving innovations mark PacRite custom designed equipment for leadership.

Your inquiry concerning PacRite Fresh Pack or Processing Machinery will promptly make available to you a wealth of engineering knowledge and experience. Four decades of leadership stand behind every unit bearing the PacRite trademark. Write or call American Machinery, Box 3228, Orlando, Florida, for further details.

AMERICAN MACHINERY CORPORATION

DIVISION OF Aeroglide CORPORATION

PROCESSING



PRESSURE COOKER-EXTRUDER. Lists eleven advantages of patented pressure cooker-extruder designed to cook or gelatinize starches and cereal grains and to create an expanded product by forcing the cooked material through a relatively thin die. Used extensively in production of pet foods and in processing corn meal and flour for use as binders and fillers for other products. 4p—Sprout, Waldron & Co., Inc., Muncy, Pa. (Circle 415)

TIMERS FOR COOKING. Presents portable timer for baking, cooking, toasting, mixing, frying, etc. Has 8-in. dial, 60-min time range, automatically turns small appliances on and off.—* Dimco-Gray Co., Dayton, Ohio. (Circle 416)

LIKE TINY CUSHIONS. Tells how micron-sized silica gels are insurance against compaction that can turn a bag or drum of food powder into a solid mass. Less than 1% by weight is used to create an invisible cushion within the product.—* W. R. Grace & Co., Davison Chemical Div., Baltimore, Md. (Circle 417)

COLD STORAGE TANKS. Reviews refrigerated storage tanks engineered to meet specific cooling and product specs. Designed for use with various refrigerants, tanks have integral direct-expansion section which cools product as it enters tank. 4p—CP Division, St. Regis Paper Co., Chicago. (Circle 418)

NEW DRYING TECHNIQUE. Explains how unique approach to design and building of drying machinery provides user with distinct benefits and advantages. 12p—Thermal Exchange Systems, Morton, Pa. (Circle 419)

SCRAPED-SURFACE HEAT EXCHANGER. Lists units for continuous processing of any product that can be pumped. Specifically designed to handle products which form a surface film on heat-exchange surfaces. 4p—Cherry-Burrell Corp., Chicago. (Circle 420)

VARIABLE-SPEED MIXER. Details operating characteristics of firm's variable-speed mixer. Gives in-bakery test results involving Liquid Sponge dough mixing times, provides complete specs. 4p—American Machine & Foundry Co., Richmond, Va. (Circle 421)

SANITATION & MAINTENANCE

PLASTIC IDLER WHEELS. Presents thermoplastic idler wheels which are self-lubricating, can be steam cleaned. Designed for non-drive application on conveyors in food processing, meat packing, beverage plants. 2p—Rex Chainbelt Inc., Milwaukee. (Circle 439)

HEAVY-DUTY VACUUM CLEANING. Illustrates complete line of heavy-duty industrial vacuum equipment for housecleaning and product recovery. Includes data on special applications, power and storage capacities. 4p—Invincible Vacuum Corp., Dover, Ohio. (Circle 440)

STAINLESS STEEL PARTS. Catalogs stainless steel fittings, valves, parts, products, and components for food, dairy, beverage, baking and confection industries. Shows more than 150 products. 28p—Alloy Products Corp., Waukesha, Wis. (Circle 441)

COMPUTERIZED LAMP PROGRAMMING. Tells how firm's free computerized relamping advisory service can save you lots of money in annual lighting costs. Correct timing gives you more light at less cost. 6p—Sylvania, subsidiary of GT&E, Danvers, Mass. (Circle 444)

MORE DURABLE HEATING CABLE. Details Teflon-coated electric heating cable that is unaffected by moisture, chemicals, vapors or weathering. For freeze protection and for heating piped liquids. 4p—Edwin L. Wiegand Co., Pittsburgh, Pa. (Circle 445)

*From advertisement in this issue

PACKAGING

METAL TUBE PACKAGING. Includes brief description of collapsible metal tubes, how to select right type of tube opening, metal and carton for particular product. Includes chart of tube sizes, capacities and necks.—Metal Tube Packaging Council of North America, New York City. (Circle 429)

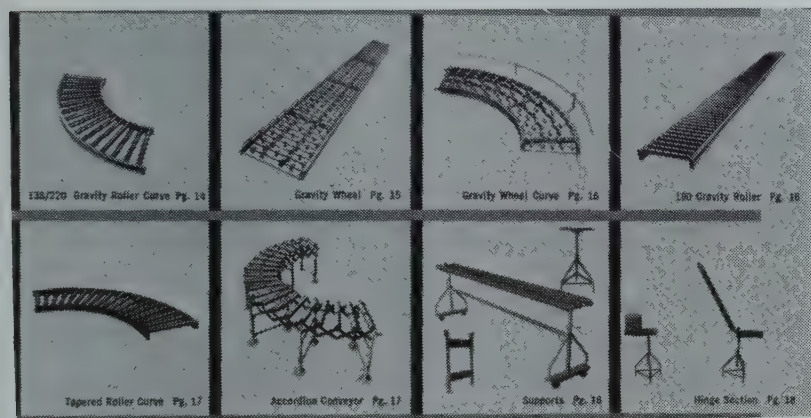
EASY-CLEAN FILLER. Discusses rotary piston filler that takes only 30 min to clean from shutdown to visual inspection. Valve plug just twists and slides out, then piston lifts out.—The Pfaudler Co., Rochester, N.Y. (Circle 430)

HOW TO MARK IT. Describes newest and latest product identification and shipment addressing marking methods available today to business and industry.—Weber Marking Systems Inc., Arlington Heights, Ill. (Circle 431)

VACUUM/GAS BAG SEALER. Explains advantages of vacuum/gas bag sealer with optional pneumatic feature that speeds operation. Air operation eliminates operator controlling cycle. 2p—Packaging Aids Corp., San Francisco. (Circle 432)

HANDLES PLASTIC BOTTLES. Presents totally new packaging and material handling system that accumulates, stores, transports, decorates, and dispenses plastic bottles of all sizes. 8p.—The Stewart-Walker Division, Hunter Industries, Santa Fe Springs, Calif. (Circle 433)

MATERIALS HANDLING



HANDLING WITH CONVEYORS. Contains detailed drawings, descriptions and specs on complete line of package and unit handling equipment. Includes 25 different types of conveyors. 20p—Materials Handling Equipment, FMC Corp., Riverside, Calif. (Circle 451)

METAL CONVEYOR BELTS. Tells how standard-weight and heavy-duty galvanized flat wire belts are warehoused in a variety of widths at many locations. Also carry flexible metal belts, sprockets and turn units.—U. S. Steel, Pittsburgh, Pa. (Circle 452)

DRUM HANDLING EQUIPMENT. Features five models of racks, eight models of lifters, 10 drum stands, two-wheel hand trucks, drum trucks, and drum dollies. 6p—Economy Engineering Co., Chicago. (Circle 453)

POWER AND FREE CONVEYORS. Diagrams power and free conveyors that combine positive drive, fixed path features of overhead trolley conveyors with flexibility of gravity-type monorail systems. 12p—Anchor Steel & Conveyor Co., Dearborn, Mich. (Circle 454)

LOW-PROFILE PALLET DOLLY. Gives features of low-to-the-floor pallet dolly with parallel rows of casters mounted on top and bottom surfaces of corrugated steel mat. For pallet buildup and break-down operation and massive movement of loaded pallets in warehouses. 4p—American Machine & Foundry Co., York, Pa. (Circle 455)

INGREDIENTS

AIDS PHYSICAL PROPERTIES. Describes all grades of firm's fumed silica, used for thickening and thixotropy, aqueous and pH dispersions, free-flow and anti-caking, anti-settling and suspension, and emulsification. 28p—Cabot Corp., Boston, Mass. (Circle 466)

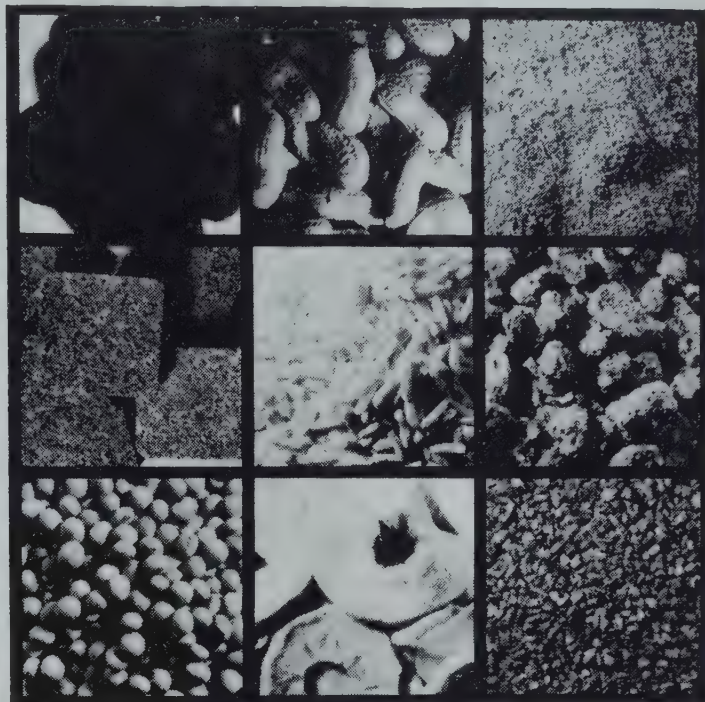
USING SORBITOL. Explains how small amounts of sorbitol solution maintains quality and freshness of grained confections, particularly starch-cast cream mints (enrobed), starch-cast grained marshmallow, bar fudge, and starch-cast high-cook caramel. 24p—Atlas Chemical Industries, Inc., Wilmington, Del. (Circle 467)

INCREASES SHELF LIFE. Contains sources, end-uses, properties of food-grade antioxidants for stabilizing products against oxidative deterioration. Covers effectiveness, methods of addition, concentrations, availability. Used in fats, oils, cereals, nuts, packaging materials, etc.—Eastman Chemical Products, Inc., New York City. (Circle 468)

*From advertisement in this issue

DRYING NEED?

Aeroglide May Have Already Solved It.



You name it. Petfoods to charcoal briquets, shelled peanuts to walnuts in the shell, small grains to citrus pulp. Aeroglide engineers have innovated moisture control systems for the gamut in food, feed and chemical industries.

Of course, new products, new applications and need for economies in existing systems are always emerging. So we can't say we've done it all. But this wealth of experience and a big emphasis on engineering know-how gives Aeroglide a substantial lead from the start in answering your needs. We are completely impartial when it comes to specifying style of hardware, because we build all styles of process drier/coolers. HORIZONTAL CONVEYOR (heavy duty and light duty), VERTICAL TOWER, and ROTARY DRUM — all with Aeroglide Induced Draft drying and cooling.

Got a drying need coming up? Send for Bulletin 500-68 or call Area 919/834-3601, Raleigh, North Carolina.

Aeroglide
CORPORATION

Can a mere cap help sell your dressings?

And what consumers want in the dressings they buy—particularly mayonnaise—is the same fresh flavor every time.

Over the years, the housewife has learned to equate freshness in glass-packed foods with vacuum protection. White Cap recently conducted intensive consumer research that supported this idea. We found that more than two out of three shoppers prefer vacuum protection for the dressings they buy. This is how they said it: “seals in the flavor,” “makes mayonnaise taste better,” “makes it stay fresh longer,” “no air can get

in,” “more sanitary and doesn’t spoil.”

We expected comments like that. Consumers are sold on vacuum packing. And they’re sold on the “Twist-Off” cap—they like the easy, positive re-seal it offers.

But we also found something we didn’t expect. *Most homemakers think their present dressing brand is vacuum sealed.* And they were very surprised—and even disappointed—when they found out it wasn’t.

It’s very clear that consumers want vacuum protection on their dressings. This suggests to us, and

surely to you, that there’s a wide open track for a dressing packer to build quite a competitive edge for his product. We’re convinced that vacuum protection, backed by proper promotion, will move your product as never before.

Why aren’t more dressings vacuum packed today? Packers understand that vacuum protection keeps in freshness and flavor. And that this improves the product particularly under today’s more hectic retail operating conditions. It’s getting tougher and tougher for retail management to make sure that older



It can if it gives consumers what they want.

stock moves first.

The probable reason more dressings aren't vacuum packed is the initial cap cost. The "Twist-Off" cap normally costs more than a screw cap. To buy. But it can cost less to use. Progressive packers have found the production economy of the vacuum cap actually can cancel out the higher cost of the cap itself.

Retail marketers prefer the vacuum cap, too. They know a screw cap "breathes." And that stock sealed with a screw cap must be checked and rotated regularly. They also know that White Cap's "Twist-Off"

vacuum cap gives products longer shelf life with a minimum of attention. Retail marketing men who are your customers know "Twist-Off." And they prefer it because it makes products look better, handle better, and sell better.

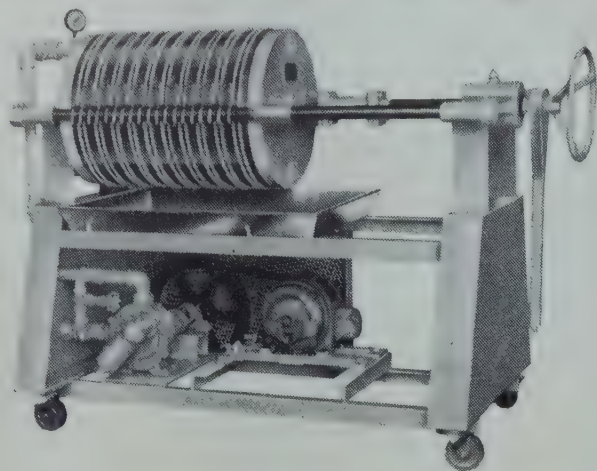
Give consumers what they want. Get the facts from White Cap. Your White Cap man will bring you comprehensive data on all pertinent phases of this situation. He knows the field and how to help you. He will show you how easy it is to give consumers what they want—vacuum protection for their dressings.

A note to White Cap is all it takes. Address: Sales Department, White Cap Division, Continental Can Company, 1819 N. Major Avenue, Chicago, Illinois, 60639.

WHITE CAP DIVISION
Continental
Can Company



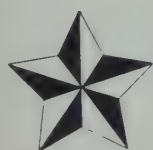
Watch Dog!



Hot frying oils must be filtered!

The Star line of hot oil filters is specifically designed for the fried food industry. Here is a check list of their advantages:

- Remove burnt particles fast
- Keep fatty acid content down
- Minimize rancidity
- Eliminate messy filter aids or patented devices
- Filter out micron sized particles **FAST!**
- Reduce waste by re-using filtered oils and shortening



SEND FOR CATALOG & PRICES

STAR TANK & FILTER CORP.

875 Edgewater Road, Bronx, New York 10474
Telephone 212-323-6450

Circle 79 on Inquiry Card

Just Off the Press (continued)

CRAMMED WITH FLAVOR. Offers wide variety of flavoring products with prices, shipping volumes, and recommended quantity usage. Firm also offers custom blending. 16p—Henry H. Ottens Mfg. Co., Inc., Philadelphia. (Circle 400)

IMITATION TOMATO FLAVOR. Presents imitation tomato flavor available in liquid or powder form for use in tomato juice, tomato soup, catsup, sauces requiring tomato flavor, etc.—Naarden-Flavorex Inc., Baltimore, Md. (Circle 470)

INSTRUMENTS & CONTROLS

MEASURING SUGAR COLOR. Discusses the two areas of concern in sugar color: whiteness of the crystal and clarity of water solutions. Describes method and lab procedure used by firm to measure sugar color. 8p—Holly Sugar Corp., Colorado Springs, Colo. (Circle 471)

RAPID FAT ANALYZER. Details electronic instrument which, in three seconds, will read the percent fat in a sample of meat within 1% accuracy of official lab methods. Sample is x-rayed, and lean meat absorbs more than the fat. Measuring radiation of sample gives percentage of fat. 4p—Anyl-Ray Corp., Waltham, Mass. (Circle 472)

PORTABLE TIMER/COUNTERS. Illustrates advantages, applications and operation of \$195 portable and \$170 panel-mount timer/counters. Reliable, inexpensive devices provide variety of timing, counting and control functions as delay or interval timers, event timers, stop clocks, etc. 8p—Heli-Coil Corp., Danbury, Conn. (Circle 473)

ANALYZES FOOD TEXTURE. Presents new instrument for objective analysis of food texture. Masticator simulates action of mouth, giving a texture profile of products. 6p—C. W. Brabender Instruments, Inc., South Hackensack, N. J. (Circle 474)

RETRO-REFLECTIVE SCANNER. Introduces explosion-proof retro-reflective scanner which ends critical alignment problems for users of photoelectric equipment. Mis-aligned discs do not affect operation, and built-in filter blocks ambient fluorescent lighting. 2p—De-Tec-Tronic Corp., Chicago. (Circle 475)

CONTROLS BULK LEVEL. Illustrates redesigned level control for bulk materials featuring new dust-tight shaft seal. Includes specs, electrical requirements, application considerations. 8p—The Bin-Dicator Co., Detroit. (Circle 476)

PROCESS CONTROLLERS. Describes instrumentation for readout of electronic load cells used in industrial weighing and process control systems. Covers strip chart recorders, solid-state digital indicator printers, weight and force indicators, etc. 20p—Revere Electronic Div., Neptune Meter Co., Wallingford, Conn. (Circle 477)

SONAR LEVEL DETECTOR. Describes six models of ultrasonic level monitors which accurately and continuously measure the level of solids or liquids of all types, offering ranges of 2-150 ft.—Western Marine Electronics, Seattle, Wash. (Circle 478)

MEASURES MOISTURE CONTENT. Details various systems specifically designed to measure the total average moisture content of entire packages, bales, or skeins of non-metallic materials possessing hygroscopic properties. 8p—Forte Engineering Co., Norwood, Mass. (Circle 479)

IN-LINE MEASUREMENT. Describes applications of inline process refractometers for the continuous measurement of coffee, lube oil, black liquor and soluble solids.—Anacon, Inc., Ashland, Mass. (Circle 480)

THE ALL-SEEING EYE. Remote indicating system brings hard-to-see liquid level readings down to eye level, extends level indication throughout a plant. Provides alarm and automatic control response when needed. 14p—Yarway Corp., Blue Bell, Pa. (Circle 481)

SOME LIGHT READING. Photoelectric control catalog provides 51 application sketches, with description, specs and prices of 130 pre-engineered control packages. 36p—Autotron, Inc., Danville, Ill. (Circle 482)

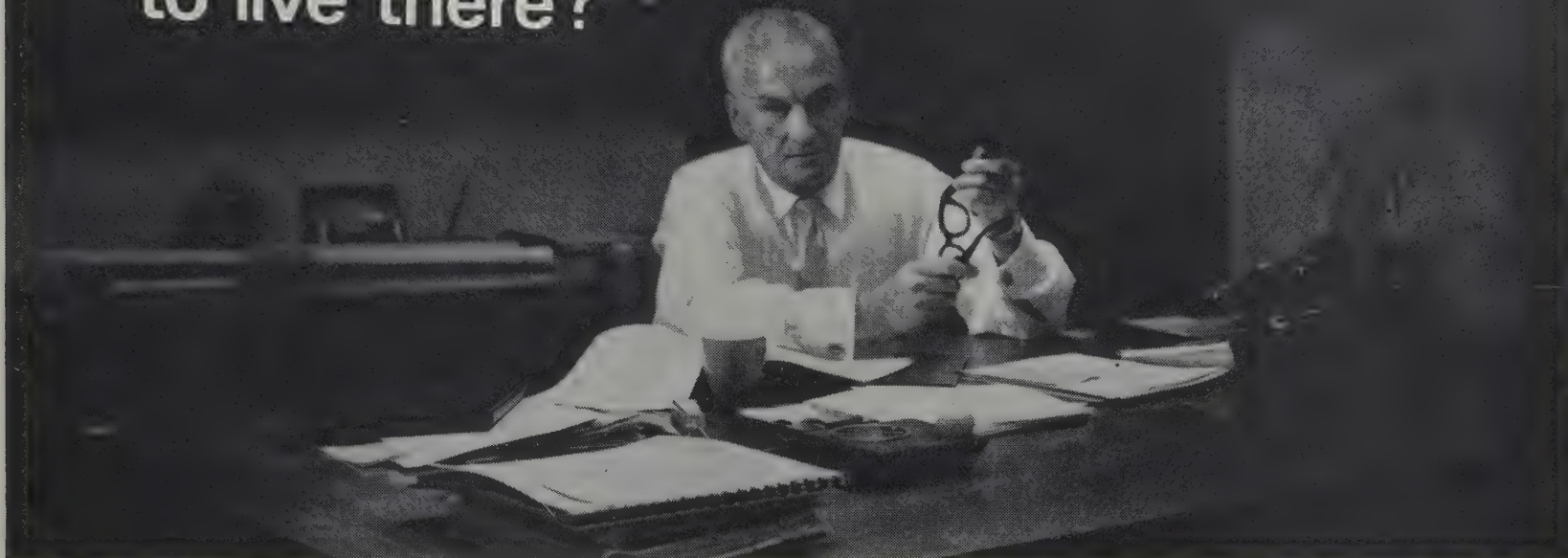
TRANSISTORIZED RELAYS. Illustrates, describes four models of transistorized relays: standard-duty, fail safe standard-duty, heavy-duty, and extra sensitive heavy-duty. With application sketches. 6p—Cutler-Hammer, Milwaukee. (Circle 483)

FOR FREE LITERATURE...

... Simply circle key item number (found at the end of each item) on handy Inquiry Card—back of book. Then print your name and address, and mail.

	FullJet® SPRAY NOZZLES
name:	
	FULL CONE
pattern:	
examples:	
	Choice of over 500 types and sizes ... 0.14 to 2130 GPM capacities at 20 psi ... 15° to 165° spray angles ... brass, iron, steel, stainless steel, hard rubber and PVC. Patented de- signs, precision machined for un- equalled performance.
facts:	
made by:	SPRAYING SYSTEMS CO. 3212 Randolph Street Bellwood, Illinois 60104
For complete information WRITE FOR CATALOG... 25A	

**"I wonder... so many facts
point to expanding in Wisconsin,
but what's it really like
to live there?"**



two ways to get candid answers to this key question

1. Talk to a Wisconsin business executive — off the record — at his office or at yours, or on the phone. We will help arrange this kind of get-together for you . . . through the Wisconsin Development Authority. This is a group of more than one hundred Wisconsin company presidents, many in the same business as yours.

These WDA members are knowledgeable, practical-minded executives who welcome *candid* man-to-man discussion with you. They will answer your questions frankly.

Write us on your executive letterhead, or return the coupon, and we'll arrange this kind of meeting for you. (In addition, we'll send you useful new booklets on Wisconsin's industrial advantages and opportunities.)

2. Just beginning to think about expansion in Wisconsin? A possible move to Wisconsin? See what it's really like to live here and do business here; "be our guest" in your home or office — *free* — through the pages of our newspapers! They reflect our lives — day after day, revealing everything from the price of eggs to the status of the labor market as portrayed in classified ads.

We'll gladly send to any *qualified business executive* a paper from a different Wisconsin community every day or two — a total of 30 issues in all. We'll also acknowledge your inquiry with a fact kit on Wisconsin. Write — using your company letterhead, or send the coupon below. (Sorry, neighbors. This invitation open to industrialists everywhere, except those living in Wisconsin.)



Wisconsin

8 Good TAX-REASONS Why "You'll Like It Here"

- Wisconsin did not raise tax rates or add new taxes for fiscal 1967-69. All adjoining states raised taxes and/or altered tax systems.

- Property tax credit on inventories is up to 60%.

- Industry realizes an average of 22.7% relief on personal and real property tax.

- Wisconsin returns 61% of its revenues to local governments.

- We have no capitalization tax.

- Corporate income tax provides for two-year net loss carry-forward . . . no "poor year" burden.

- Our average unemployment compensation tax rate was 1.5% . . . national average 2.0% (1966).

- Per capita sales tax of median state among those having sales tax was \$42.35 . . . ours only \$22.14 (1966).

Division of Economic Development, 761 State Office Bldg., Madison, WI. 53702

NAME TITLE

FIRM NAME

KIND OF BUSINESS

ADDRESS

CITY

ZIP

STATE

PHONE NO.

1. I'm interested in speaking with your WDA business man ☐

2. Send the newspapers to my home ☐ office ☐

HOME ADDRESS

CITY

STATE

ZIP

K. King KLIMATIC KING "70"



assures ultra-clean air conditioning

Klimatic King series 70 units are designed to supply efficient heating, ventilating, filtering and cooling needs for food processing areas.

Air is passed through two filters . . . the first, a standard washable type, to remove larger dirt particles; the second a high efficiency dry type that has a cleaning efficiency comparable to electronic precipitators.

This exceptionally clean air cuts plant maintenance costs . . . improves quality control. Constant fresh air supply and air circulation reduces excess humidity...keeps room dry...reduces mold and bacteria growth . . . improves working conditions.

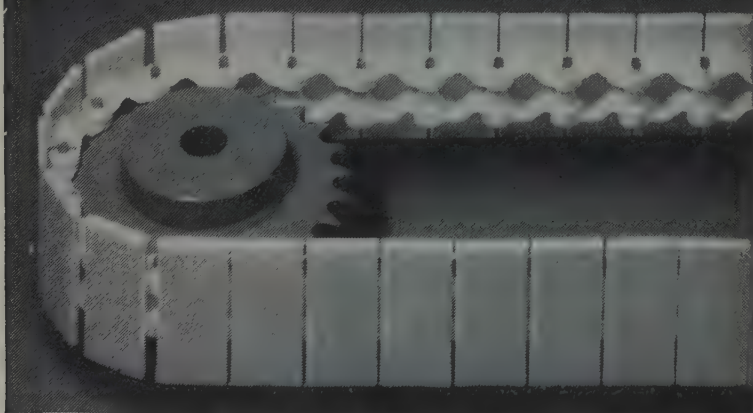
Klimatic King units are easy to clean, may be mounted in or out of building.

Write for **K. King** detailed technical and information bulletins.

KLIMATIC KING Manufacturers of	K. King COMPANY OF OWATONNA 905 North Cedar St. • Owatonna Minn. sharp freeze, cooling, ventilating and heating systems.
---	---

Circle 83 on Inquiry Card

Delrin Nylite "D" Chain



STRONGEST PLASTIC CONVEYER CHAIN ON THE MARKET!

FENCO Nylite "D" Delrin Chain affords maximum protection for product and container. It eliminates the use of top plate lubricants, and its extra smooth slippery surface prevents abrasion and scratching of aluminum, glass, plastic, and steel containers. Designed for clean, fast, quiet operation with less maintenance than other chain.

And Nylite "D" is STRONGER BY TEST than any other plastic conveyor chain. It's also the only all-Delrin conveyor chain on the market that fits the standard 3/4" pitch A.S.A. #60 sprocket.

FENCO carries a complete stock of Delrin Chain at all times with the widest range of top plate widths in the industry. Available in 3", 3 3/4", 4", 4 1/2", 6", and 7 1/2" widths.

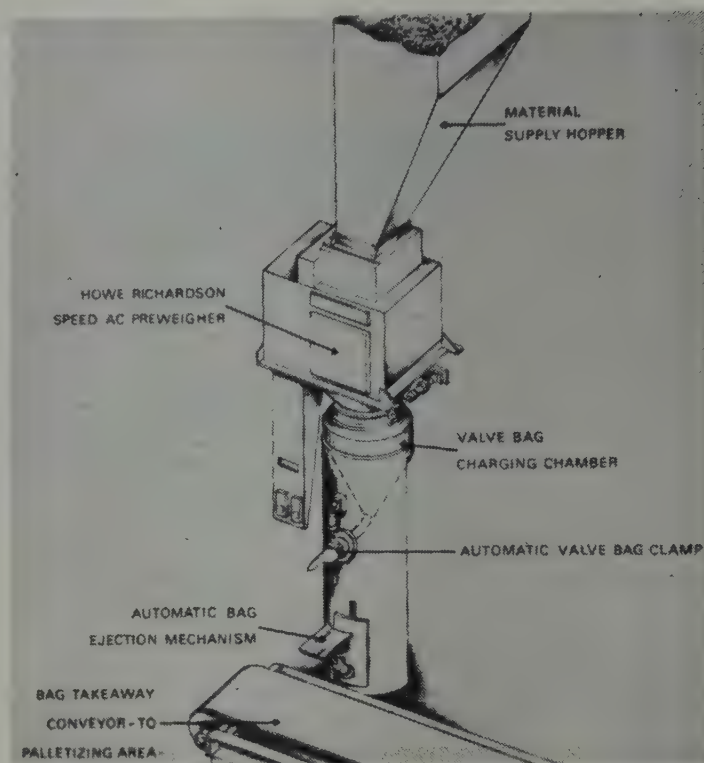
Order today—your Nylite "D" is shipped tomorrow! For more information write to the original producers of all-plastic conveyor chain.

FENCO, INC.

154 EAST ERIE ST.
CHICAGO, ILL. 60611

Circle 84 on Inquiry Card

FE NEWS SPOTLIGHT:



TWICE THE SPEED of competing machines is offered by new valve bag filler for granular products. Feedback loop maintains preset weight tolerances within ± 1 to 2 ounces.

DOUBLES BAGGING SPEED

Net-weighting bag filler handles free-flowing granular products such as rice and salt

A NEW VALVE BAG FILLER, tradenamed Valve-Pak, offers up to twice the bagging speed of other makes. And it controls its own accuracy to preset close tolerances.

The fully enclosed filler (Howe Richardson Scale Co., Clifton, N.J.) handles 50-lb bags at speeds of 10-12/min. It handles dry free-flowing, non-dusty granular products such as rice and salt in 25- to 100-lb bags. Price is said to be competitive with other makes of valve bag fillers.

In many installations, one Valve-Pak filler can do the work of two conventional units. Bag weight tolerances can be preset and then maintained automatically by a self-checking, self-adjusting feedback loop. Fillers operate on the net weighing, instead of gross weighing, principle. Each draft is precisely preweighed and checked, then discharged automatically via a pressure tank through a nozzle on which bag is clamped. Operator does not have to wait for weighing—while one bag is filling, the next draft is being weighed out.

Circle 361 on Inquiry Card

RECENT INVENTIONS

PRODUCTS

Freeze-Dried Dietary Product From Mixture of a Foodstuff With Added Amino Acid and Methyl Cellulose.—C. H. Barr, Courtland Laboratories, Los Angeles. No. 3,360,374.

Yeast - Leavened Bakery Products With Added Mono Aliphatic Ester of a Dicarboxylic Acid and Shortening Compositions With a Mono Aliphatic Ester of Adipic Acid.—B. D. Buddemeyer, The Planipus Co., Kansas City, Mo. No. 3,360,375.

An Opaque Thixotropic Shortening Having Appearance of Plastic Shortening at Temperature Below 90F (When at Rest) and Being Pourable Above 50F (When Worked).—R. D. Dobson, The Procter & Gamble Co., Cincinnati. No. 3,360,376.

Low-Calorie Margarine-Substitute Product Substantially Free of Non-Modified Proteinaceous Matter and in Form of a Water-in-Oil Emulsion.—J. G. Spitzer, Mamaroneck, N.Y. No. 3,360,378.

PROCESSING

Preparing Packaged Sliced Bacon by Smoking Bellies, Surface-Heating to Set Smoke, Chilling, Forming, Slicing, Collating Slices Into Shingled Condition, Applying Dry Cure Onto One of Two Shingled Surfaces and Oxygen-Free Packaging.—J. C. Bard, Oscar Mayer & Co., Chicago. No. 3,359,121.

Making Whole Cranberry Sauce by Hot-Water Extracting Pectin, Color, Flavor and Solids From Cold-Pressed Berries and Then Adding Extract and Sugar Syrup to Whole Cranberries and Cooking.—S. I. Skelskie, Ocean Spray Cranberries, Inc., Hanson, Mass. No. 3,360,379.

Continuously Recovering Decaffeinated Soluble Coffee Extract From Roasted Ground Coffee in Successive Stages of Concurrent Aqueous Extractions.—L. Nutting, Hills Bros. Coffee Inc., San Francisco, Calif. No. 3,361,571.

EQUIPMENT

Combination Extrusion Pipe and Conveyor Means for Transporting Meat Emulsions.—R. P. Nelson, Armour & Company, Chicago. No. 3,351,173.

Apparatus for Making Milk Caramel Mass for Manufacturing "Iris."—A. K. Karpenko, Moscovskaja Konditerskaja Fabrika "Krasny Oktjabr," Moscow, USSR. No. 3,356,045.

Cored Apple-Slicing Machine.—W. S. Pease, F. B. Pease Co., Rochester, N.Y. No. 3,357,469.

Crumb-Collecting Type Deep-Fat Fryer.—R. J. Anetsberger, Anetsberger Brothers, Inc., Northbrook, Ill. No. 3,363,541.

PACKAGING

Filling Containers With Pressure-Supplied Beverage When Containers Have a Counter Pressure Set Up Within Them When They're Engaged for Filling Action.—K. F. Friendship, Geo. J. Meyer Mfg. Co., Cudahy, Wis. No. 3,357,461.

Machine for Making and Filling a Series of Bags of Type Formed

From a Strip of Material Folded Lengthwise and Divided Into a Number of Compartments by Transverse Seams.—D. Quaadgras, Stamicarbon N.V., Heerlen, Netherlands. No. 3,359,703.

Disposable Container for Dispensing Liquids With Inner Bag Having a Pour Spout.—D. Simkins, Continental Can Co., N.Y.C. No. 3,361,309.

Food Package for Use in Electric Toasters.—P. F. Jacobson, Westport, Conn. No. 3,361,576.

Want more information on any of these recent patents—if so you may obtain detailed printed copies by writing direct to the Commissioner of Patents, Washington, D.C. 20402, giving patent number and enclosing 50¢ for each copy.

LIQUIDATION . . . former Armour & Co. packing plant @ Omaha, Nebraska.

RENDERING EQUIPMENT

(also glue, fertilizer, etc.)

- 1—Bird 24" x 38" centrifugal, T304 SS.
- 1—Sharples PN-14 centrif., T316 SS.
- 1—Reineveld #EHVC-50" horiz. auto. batch centrif., T304 SS, auto. cycling.
- 2—Sharples DG-2 autojectors.
- 1—Sharples AS-16 super centrif., 304 SS.
- 5—Hercules jacketed filters, horiz. tank, from 80 to 414 sq. ft.
- 3—Anderson expellers: Duo & RB.
- 1—Bufflovak 2500 sq. ft. double effect evaporator, 304 SS contacts, vac.
- 1—Swenson 2475 sq. ft. triple effect evap. copper tubes, cast iron bodies.
- 1—Girdler deodorizer, 5' x 25' tower, w/ase.
- 1—9' x 9' single drum glue dryers or chillers.
- 1—Procter & Schwartz 9'-8" x 28' conveyor dryer.
- 1—P. & S. 6' x 48' conveyor dryer w/ase. (hog hair drying line).
- 2—Anco 4' x 9' dbl. drum dryers.
- 1—DeLaval 770 sq. ft. plate cooler, SS.
- 1—Votator, 8' x 72", stainless.
- 3—Votators: lard (5000#), shortening (3000#).
- 15—Anco horiz. rot. cookers . . . sizes from 4' x 10' to 5' x 18', w/ase.

SS TANKS & PUMPS

- 1—1500 gal. SS jkt. kettle, 60" x 90", agit.
- 1—700 gal. SS jkt. kettle, agit.
- 1—250 gal. SS jkt. kettle, dbl. motion agit.
- 1—1500 gal. SS vert. tank, 82" x 68", w/colis.
- 1—1200 gal. SS vert. tank, 72" x 68", dished heads, coils & salt.
- 70—Stainless steel tanks, rect. & cylind., from 100 to 3000 gal.
- 5—Waukegan sanitary SS pumps: #125, SS, 25, etc., w/vari-drive.
- 4—LaBour #15W, 2" x 1 1/2", SS, 5 HP.
- 1—Mayno type SSQ screw pump, SS.

BACON—SAUSAGE—HAM EQUIP.

- 20—Ham cookers, 6' x 7' x 5', w/controls.
- 4—Ty-Linkers: #140AC & #122AC.
- 5—Ty-Peeler, model #500, for skinless.
- 4—Anco casing strippers.
- 2—Boss 24" x 36" sausage stuffers.
- 3—Stuffers . . . ham & meat meat.
- 8—AB Stridhs casing stuffers . . . #7B89/54, 5-800 89/54, 7-60 1113/55.
- 1—Anco bacon weighing line, 15" x 35', SS table, (6) scale positions.
- 1—Anco bacon press 12" x 27" max.
- 1—Thiele SS bacon wrapper.
- 1—Dan-D-Shaper #D-90 bacon former.
- 2—Julian smokehouses, dbl. door, SS.
- 1—Electronic smoker, SS, 8' x 6' x 16'.

PACKAGING EQUIPMENT

- 5—Case gluers, top & bottom, w/comb. units Std. Knapp, ABC, Packomatic, etc.
- 1—Viking "Tite-Wrap" for home, all SS
- 1—Cry-O-Vac clip applicator.
- 1—Emhart case packer, for (24)—12 oz. cans.

MISC. ITEMS

- 15—Ammonia refrig. comp., to 600 HP.
- 12—Room & cabinet coolers.
- 1—Ammonia dis-associator, 4000 cu. ft./hr.
- 15—Modern air compressors, packaged units, to 30 HP.
- 20—Agitators, top-entering & side entering, SS.
- 43—Flat belt conveyors, lengths to 30', SS.
- 50—SS covered tables, to 6' x 11'.
- Also—Cafeteria equip., laundry equip., blowers, agitators, (100) steel tanks, hooks, buckets, etc.

SEND FOR BROCHURE!

Thousands of items too numerous to list . . . CALL OMAHA (area 402) 733-3325 . . . ASK FOR BOB BETZ



PERRY

EQUIPMENT CORPORATION

1411 North Sixth St., Philadelphia, Pa. 19122
Phone 215-763-3505 • Telex 84-5397



**To go from anaerobic
to aerobic bacteria,
they went to LIGHTNIN.**



New England Apple Products Company welcomes other area communities and industries to inspect its treatment facility. Contact Mr. James A. Rowse, President, at Littleton, Mass.

New England Apple Products Company of Littleton, Mass., had a waste-treatment problem. They discharged processing water, containing sugars and fruit acids, into a nearby lagoon.

But anaerobic bacteria formed, producing offensive sulfide gas. Area residents were offended.

The solution was aeration, via an 80,000-gallon tank and a 25-hp *Lightnin* aerator supplied by Suburbia Systems, Inc. Aeration promotes the growth of

aerobic bacteria, which in turn converts the waste material to carbon dioxide and biological sludge.

The CO₂ offends no one. The rich sludge is settled out and ends up as fertilizer for the local farmers. Clean water flows into the lagoon.

The system is a prime example of mechanical aeration: the combining of air with liquid. It's a *mixing* function. We're mixing experts. When you need predictable, efficient aeration, call in

your *Lightnin* sales engineer. He's in the Yellow Pages, under "Mixing Equipment." And send for a copy of our Bulletin B545 on mechanical aeration design.

MIXING EQUIPMENT COMPANY, INC.
143-n Mt. Read Blvd., Rochester, N.Y. 14603. *In Canada:* Greey Mixing Equipment Ltd., Toronto, Ont. *In Europe:* Lightnin Mixers Ltd., Poynton, Cheshire, U.K. *In Australasia:* Lightnin Mixers Pty. Ltd., Stanmore, N.S.W.

LIGHTNIN®
AERATORS AND MIXERS

MEN AND COMPANIES

FE

Personnel

Dr. D. F. Emery has been named technical director of General Mills' Quality Control Dept.



Justin M. Tuomy

Justin M. Tuomy, a food technologist at the U.S. Army Natick Laboratories, has received the Army Research and Development Award for significant scientific contribution. He was honored for developing a new method for cooking meat and vegetables together before freeze drying.

Leo D. Levinson and Marshall E. Levinson have been re-elected board chairman and president, respectively at Ocean Products, Inc., Dover, Fla.

Norman R. Camit has been appointed president of Derby Foods, Inc., Chicago.

Dr. Morton S. Cole is the new director of research for The Paniplus Co., developer and producer of food additives and emulsifiers.

William Richter and Robert H. Kellen have been elected chairman and president, respectively of The Vinegar Institute.

Irving L. Cook has been appointed senior vice president of SuCrest Corp.

Herbert F. Marston will head National Dairy Products Corp.'s newly formed Breakstone Sugar Creek Div.

Dr. W. C. Barnes has received the 1968 Pickle Packers International, Inc., "Hall of Fame" award for his contribution to pickle research and technology.

John A. Connell has been named senior vice president-North America for H. J. Heinz Co.

Lyndle W. Hess has been elected board chairman and chief executive officer of Libby, McNeill & Libby. David E. Guerrant is the firm's new president and chief operating officer.

John M. Lindley has been elected president of Campbell Soup Co., Ltd., Toronto, Ont.

Thomas H. McGuire has been elected vice president, corporate planning and development for Glyco Chemicals, Inc. He will direct research, process development, and technical services.

William T. Gildea, Jr. has been named new products manager for Howard Johnson Co.'s Grocery Products Div.

Martin J. Bishop, Superior Tea and Coffee Co., has received the Peter Gust Economou Award for outstanding service as a food industry executive.



Edward C. Jones

Edward C. Jones, president of Jones Dairy Farm, Fort Atkinson, Wis., has been elected chairman of American Meat Institute.

Industry

Hunt-Wesson Foods, Inc. will establish new corporate headquarters in a 200,000-sq ft building in College Park, Fullerton, Calif. An 80,000-sq ft R&D center will also be constructed.

Lamb-Weston, Inc. has purchased controlling interest of Unique Foods, Inc., Connell, Wash.

California Milling Corp. has acquired Southern Star Spices and Teas Co., Los Angeles, Calif.

National Starch and Chemical Corp. has established two new operating

divisions—the Adhesives and Resin Group and the Starch Group.

Florasynt, Inc. is building a \$500,000, 20,000-sq ft structure in Skokie, Ill.

Plumrose Inc. has opened its expanded headquarters and slicing plant in Springfield, N.J.

North Carolina State University, Raleigh, has opened its \$3.5-million, 97,000-sq ft center for food research and education. New facility houses teaching, research and extension activities of NCSU's Dept. of Food Science.

The new address of Swift Chemical Co. is: 1211 W. 22nd St., Oak Brook, Ill. 60521.

Chas. Pfizer & Co., Inc. has purchased Pacific Vegetable Oil Corp.'s Sidney, Neb., plant. Facility is being converted to produce a hop concentrate for the brewing industry.

Oscar Mayer & Co. has opened new distribution centers in Norfolk, Va., Memphis, Tenn., and Birmingham, Ala.

National Diversified Industries, Inc. has moved its national headquarters to: 33 Great Neck Road, Great Neck, Long Island, N.Y.

McCormick & Co., Inc. and Tubed Chemicals Corp., Easthampton, Mass., contract packer and producer of plastic tubes, have merged. Latter firm will be a wholly owned subsidiary of McCormick & Co., known as Tubed Products, Inc.

Mallinckrodt Chemical Works has acquired Washine Chemical Co., Lodi, N.J.

Michigan State University, East Lansing, has received a continuous microwave heating unit from Armour and Co. Heating unit, housed in food science department's dairy plant, will be used in pilot plant studies and as a teaching facility.

Associated Industry

Joseph V. Shanley and Ernest A. Kopp have been named president and director of engineering, respectively of St. John & Co., Chicago.

Ritter Pfaudler Corp. and Taylor

Put more power into Salmonella control

MECHANIZED POWER . . . that puts heat and driving force behind your cleaning and sanitizing. Helps you knock out bacteria-breeding soils as no man can by hand alone. Reduces risk of cross-contamination. An Oakite Steam Pistol does it for confined areas. Our Econo-Spray® goes anywhere you have a hot water tap. The Oakite Hydro-Blitz® digs out the heaviest deposits with its 500 psi jet power. (Just three among our many ways to mechanize your cleaning.)

CLEANING-SANITIZING POWER . . . that adds effective detergency and bactericidal action to assure you even faster clean-up, even lower "bug" counts. Our special FISAN® LINE of detergents and sanitizers handles food industry sanitation needs economically. Other widely used contamination fighters include Oakite Bactericide that wipes out bacteria fast. And Oakite Chlor-Tergent® that kills microorganisms and odors as it cleans.

Send for detailed bulletins.



OAKITE PRODUCTS, INC., 50 VALLEY ROAD, BERKELEY HEIGHTS, N.J. 07922
Cable: OAKITE, BerkeleyHeights
In Canada: OAKITE PRODUCTS OF CANADA LTD., ONTARIO

Men & Companies

Instrument Companies have merged. New corporate name for the firm is Sybron Corp.

W. H. Ross is the new director of research for the Diversey Chemical Co.

Diercks & Sons, Inc. has completed a controlled atmosphere storage building for potatoes in White Lake, Wis.

Robert S. Breckenridge has been appointed manager of manufacturing for the Folding Carton Dept. of Riegel Paper Corp.'s Packaging Div.

Rex Chainbelt Inc. and Pacific Flush Tank Co., Chicago manufacturer of water pollution control equipment, have merged.

Don R. Russell is the new vice president and general manager of Diamond National Corp.'s Paperboard Div.

Jones Div., Beloit Corp., Pittsfield, Mass., has formed a Food and Chemical Research Center for testing and proving process concepts applicable to the firm's line of food and chemical processing machinery.

Henry H. Hemenway has been named vice president and general manager of Western Precipitation Div., Joy Manufacturing Co.

Automation Design and Mfg. Corp. has been formed in Paramus, N.J., to offer general consulting service to the packaging industry.

Edgar T. Fields is the new executive vice president and general manager of Processing Machinery and Supply Co., Philadelphia, Pa.

H. Morgan Rogers and Edward B. Moebus have been elected president and executive vice president, respectively of Lockwood Greene Engineers, Inc.

A test facility at Schutte & Koerting Co., Cornwells Hgts., Pa., provides comprehensive data on the performance of jet vacuum pumps. Facility includes a full-scale installation of a 5-stage steam jet vacuum pump with all operating accessories.

Georgia-Pacific is building a 175,000-sq ft addition to its corrugated container plant in Buena Park, Calif.

Deaths

Erwin C. Uihlein, retired board chairman, Jos. Schlitz Brewing Co.



Seasonal Production

Spray Drying might be the solution . . .

Are you faced with the storage of perishables in times of peak harvesting? If so, spray drying can prove of immense value. In a continuous process dried product is formed with the original nutritive constituents. The process is simple, economic, and the dried product can be reconstituted as required at a later date. Do away with bulk storage of raw material. Apply spray drying.

A/S NIRO 
ATOMIZER

305, GLADSAXEVEJ . COPENHAGEN . DENMARK . PHONE 691011 . CABLE: ATOMNIRO . TELEX 5603



PALLETIZED DRUM PARTS save 96% in shipping and storage space, yet are put together quickly. The three skids in front contain the parts to make 300 metal drums like those shown.

KNOCKED-DOWN DRUMS

Unassembled metal drums, shipped in bundles, can be put together in 30 sec when needed. Palletized bundles save space and labor, too

AN UNUSUAL SHIPPING DRUM saves 96% in space when stored empty. Called "Champ" containers, the metal drums are shipped and stored knocked down but can be assembled quickly in user's plant. There are savings in unloading time and labor, too.

The new drum was developed by Southern States Containers, a division of Reynolds Aluminum Supply Co. According to Southern States, 3,000 of the partially assembled drums take the same space as 100 conventional drums. The containers are nested 40 to a bundle and can be assembled in 30 sec by three men, using equipment loaned free by the supplier.

Three sizes of drums are available. The 8.02-cu-ft capacity model (59.3-gal) is of 22- to 30-gage steel or comparable aluminum. It has a welded side seam and can be painted. Heads with 4½-in. to 15-in. openings can be provided with closure and gasket compound for complete sealing.

A standard 7.79-cu-ft capacity model (55-gal) is available in 22- to 30-gage steel or comparable aluminum, and has a fully removable head for granular or semi-solid products. It also has a welded side seam and can be painted. The head is equipped with a gasket for sealing. The 2.69-cu-ft capacity model (19.6-gal) is made with lock-seam construction. It has heads equipped with 4½-in. to 9-in. openings, and is made from 26-gage galvanized steel or comparable aluminum. Circle 364 on Inquiry Card



New! Free! Detecto Over-Under Scale Brochure shows how you can...

- stop profit loss due to overweights or underweights
- speed up packaging and production
- get 100% greater accuracy from your scale system
- get instant readout of slightest weight discrepancies
- improve inventory, counting, and pricing procedures

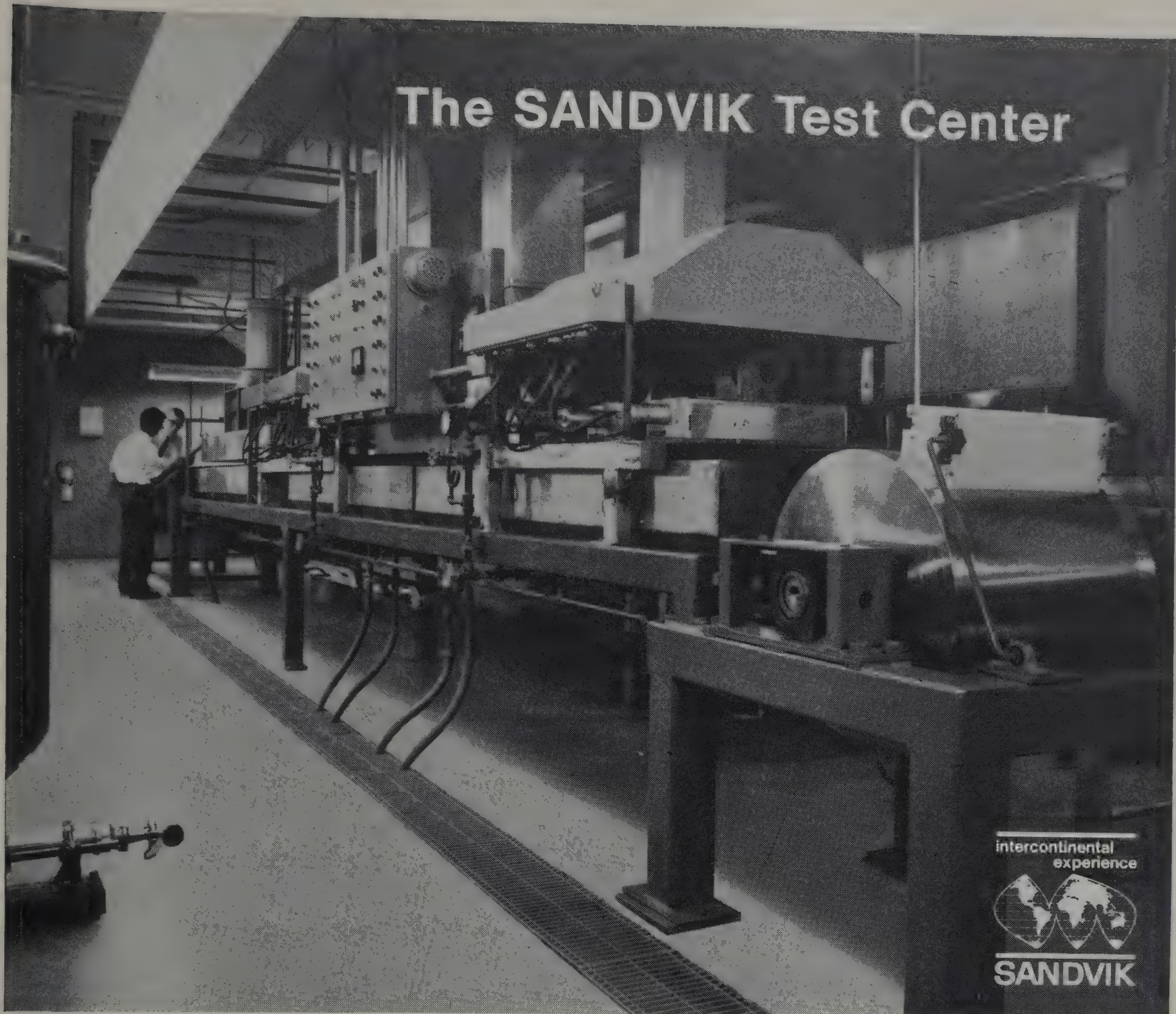
Send for your **FREE** kit on the **DETECTO** cost-cutting, time-saving over-under scale system. Today!

DETECTO SCALES, INC.

Dept. FE-12, 540 Park Ave., Brooklyn, N. Y. 11205

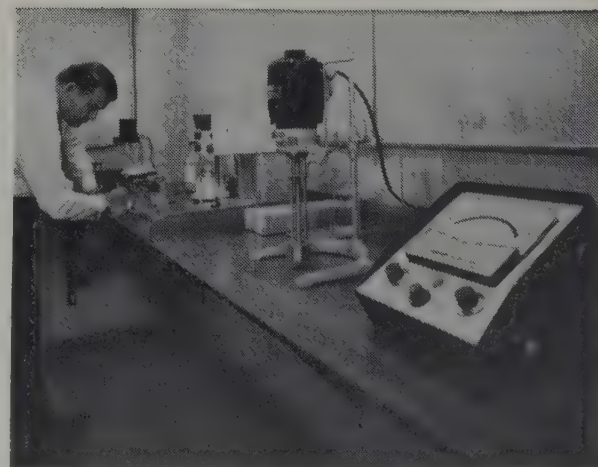
FE Annual Editorial Index
available upon request
at \$1.00 per copy

The SANDVIK Test Center



where you can develop tomorrow's continuous processing today

At our new Test Center in Fair Lawn, New Jersey, we will work with you to develop better processing via Sandvik steel belt heating and cooling units. ☐ The test center is equipped to run pilot-sized operations on a broad range of products in the forms of solids, slurries, films, sheets, granules or powders. There are two independent, zone-controlled processing lines: one for heating and drying and another for cooling and freezing on solid steel belts. These lines are capable of producing sufficient quantities of product samples for further testing and market surveys. ☐ At the test center, you get the benefit of Sandvik's processing experience in developing a prototype for successful production. This experience plus completely instrumented, processing and quality controls enable us to predetermine the design and cost of a full-scale production unit. ☐ Explore the processing potential of Sandvik steel belt units for your products. For further information, ask for Brochure No. CR-2 or contact your nearest Sandvik office.



CR/A2

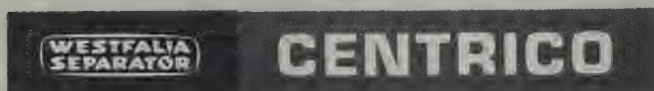
SANDVIK

SANDVIK STEEL, INC., Fair Lawn, New Jersey
CONVEYOR DIVISION
Branch Offices:
Cleveland • Detroit • Chicago • Houston • Los Angeles • Portland, Ore.
In Canada: Sandvik Canadian Ltd.:

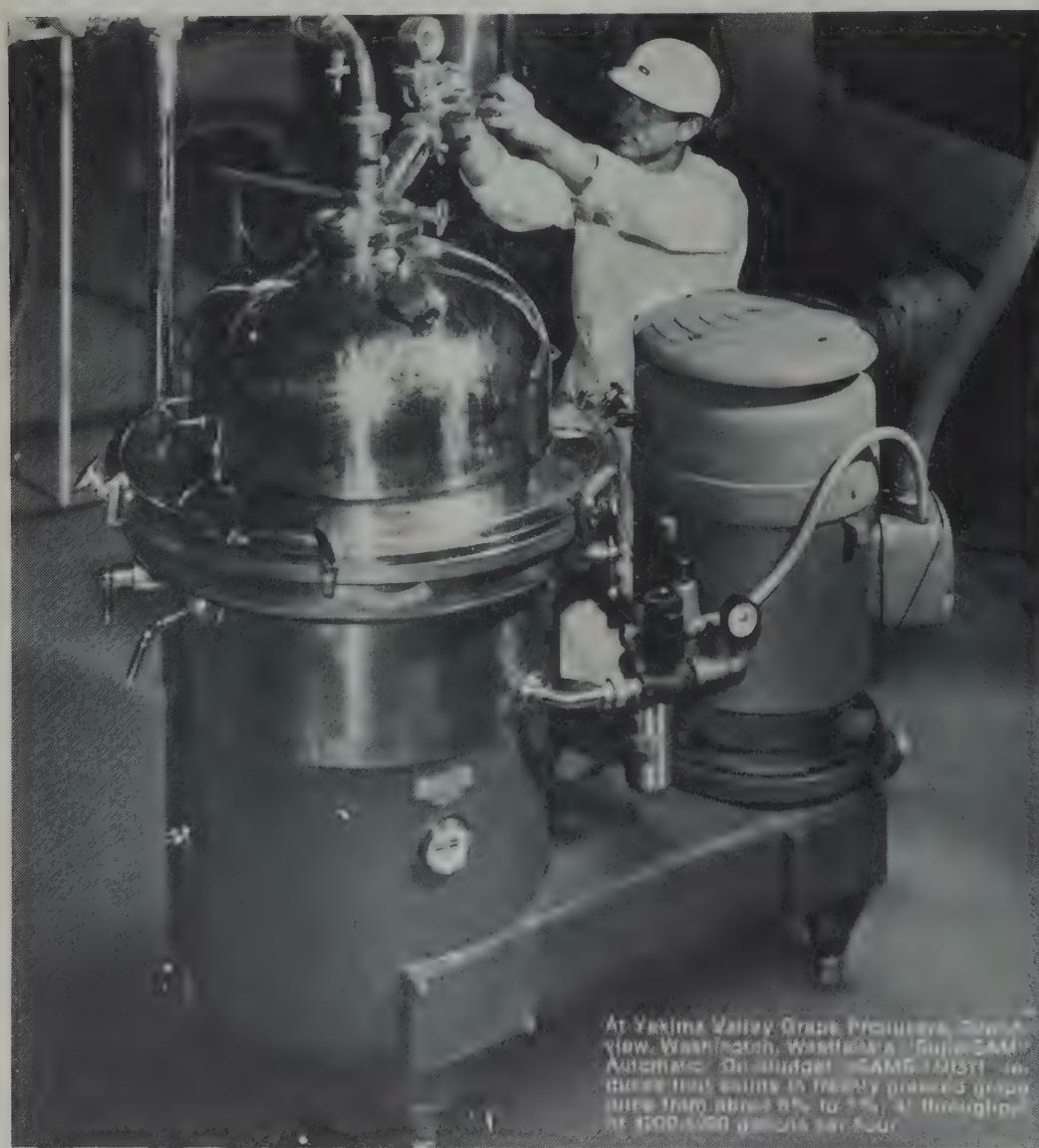
"SuperSAM"

Juice processors are reaping the benefits of process modernization with Westfalia's "SuperSAM" (SAMS-15037 Automatic De-Sludger). Enabling conversion from batch to continuous techniques, "SuperSAM" easily handles the output of continuous press systems . . . saving considerable labor and adding to sorely-needed storage capacity—with greatly improved solids control.

The Westfalia SAMS-15037 does a great clarifying job on grape, apple, berry, pineapple, citrus and other fruit juices, as well as coffee and tea extracts, beer and syrups . . . at capacities to 9000 gallons per hour. Want to know more? Ask us.



Centrico, Inc., 75 West Forest Avenue, Englewood, N. J. 07631.



At Yakima Valley Grape Processing, Duvall, Wash., Washington, Westfalia's "SuperSAM" Automatic De-Sludger (SAMS-15037) handles that juice in the dry press & grape juice from about 6% to 15% at throughput of 1000-1500 gallons per hour.

LABOR SAVER

Management

MEAL MANAGEMENT, *Third Edition*, by Faye Kinder, The Macmillan Co., 866 Third Ave., New York, N.Y. 10022, 1968, 552 pp., Price: \$7.95.

The text discusses first, spending for food in the U.S. Next it states food laws, regulations, definitions and standards of identity for food and food grading. This information is particularly important with the advent of the many items in the supermarkets. Several chapters are devoted to information on the various food classes, e.g., dairy products, meats, fruits and vegetables, prerequisite to making buying decisions. Details of planning meals are described to a considerable extent.

Nutrition

FUNDAMENTALS OF NORMAL NUTRITION, by Corinne H. Robinson, The Macmillan Co., 866 Third Ave., New York, N.Y. 10022, 1968, 669 pp., Price: \$7.95.

Text contains a basic foundation of nutrition science and a practical approach to dietary selection. Many tables and illustrations support and amplify text. References to recent literature could be helpful in further nutrition study.

MANAGING FOR PROFITS, by Harvey C. Krentzman, *Small Business Administration* #1986, Available from Supt. of Documents, U.S. Government Office, Washington, D.C., 20402, 1968, Price: 65¢.

EGG PURCHASE, CONSUMPTION AND USE PATTERNS, A. E. Res. 251, by L. B. Darrah and Ned Hanna, Jr., Cornell University Agricultural Experiment Station, Ithaca, N.Y. 1968, 34 pp.

CLASSIFIED ADVERTISING

PACKAGE MACHINERY

PNEUMATIC Vacuflow 16&24 Head Fillers
RESINA Automatic Innersealer Litter
STANDARD KNAPP T&B Case Sealer #429
CLYBURN Cartoners Model B & C

BARTELT POUCH MAKERS & FILLERS

CECO Model 40 & 3901 Carton Sealers
PNEUMATIC High Speed Cartoning Lines
PNEUMATIC Fillers—Cappers—Labelers
WHIZ 18 Cup Rotary Volumetric Fillers
PNEUMATIC Double Package Maker Lines
BRIGHTWOOD Heat Seal Cartoners
SUREWAY Quadnumatic Case-TIN, GLASS

PARTIAL LIST OF EQUIPMENT

Please send us your inquiries and surplus listings

CHARLES S. FELD

PACKAGE MACHINERY SPECIALIST
3601 Johnson Ave., Bronx, N. Y. 10463
PHONE: (212) 543-7263

Circle 513 on Inquiry Card

GLASS, METAL, PLASTIC VACUUM BOTTLE FILLERS



Liquid Filling — 1 oz. to gallon size.
Juices, Chocolate, Cider, Syrups, Vinegar,
Bleach Water, Oil, and Many others.

Sanitary, all stainless steel.

Remanufactured from stock dairy filling machines.

We sell, trade, lease. Over 30 machines in stock.

Call or write:

FOGG DAIRY SALES

257 N. River Ave., Holland, Mich. 49423
Phone: Area 616 - 392-3269

Circle 516 on Inquiry Card

100% NYLON STRAINERS

FOR FOOD PROCESSING

Reusable — Non-Clogging
20-200 Mesh

Write for brochure and swatches

FAST-FLO CORP.

1707F Kings Highway, Brooklyn, N.Y. 11229

Circle 517 on Inquiry Card

SELECTED ITEMS

DRYERS: Stokes 42" x 120" Chrome Plated,
Double Drum; Devine 4' x 15' Rot. Vac., 304 SS;
Stokes Vacuum Shelf, 19-44" x 40" shelves.
BLENDERS: 27, 75 cu. ft., 304 SS
TANKS: 304, 316 SS, all sizes to 12,000 gal.
CENTRIFUGES: Batch 30, 40" 304 SS; Cont.
18" x 28" Bird, Sharples PN14, PV14, P600
HEAT EXCHANGERS: 75 to 2300 sq. ft., SS
PULVERIZERS: Mikro #5 Atomizers; #15H,
304SS; #2DH, #4TH
FILTERS: Niagara, Hercules, 304 SS, to 300 sq. ft.
REACTORS: 50 to 1500 gal., Glass and 304 SS

Send for latest circular

BRILL EQUIPMENT CO.
35-37 Jobez Street
Newark, N.J. 07105
N. J. (201) 623-7420; N. Y. (212) 732-0820

Circle 518 on Inquiry Card

STOKES WRAP-FORM-FILL

Twin tube, Volumetric, used for Cello Nuts, approx.
range 4 oz. to 16 oz., set for 4 1/2" wide bag, with
electric eye, recently rebuilt. Excellent condition.
\$5500.00

The Leavitt Corporation

100 Santilli Highway
Everett, Massachusetts 02149
617/389-2600

Circle 519 on Inquiry Card

CHECK WITH "KEHOE" SPECIAL OFFERINGS

42 x 120 American Roller Dryers
125 to 2500 gal. Homogenizers, Std. Valves
2—Girdler Rotators 4"x45" single cylinder 15 HP
6 ft. Rogers SS Vacuum Pan
60 and 100 HP Boilers
1000 gal. Homogenizer, ball valves.
5 x 5 to 10 x 10 Amm. Compressors
200 to 2000 gal. SS Tanks, Jkt. Agit.
3000 gal. Liquid Sugar Tank
1000 to 4000 gal. SS Tanks, insul.

LESTER KEHOE MACHINERY CORPORATION

(212) 447-3410 2581 Richmond Terrace
Staten Island, N. Y. 10303

Circle 520 on Inquiry Card

AARON OFFERS

DICERS:

Urschel Model SL stainless, many ranges
and sizes (6)

MIXERS:

1,000# to 10,000# for sausage, san-
itary stainless units. Many sizes in stock,
new.

STAINLESS TANKS:

Coldwall from 800 gal. to 2,000 gal.
Type 347, 1,450 gal. and 1,625 gal.

RIBBON BLENDERS:

Areco stainless sanitary sausage mixers,
2 cu. ft. to 200 cu. ft.



Write for our catalog 664

Aaron Div. of Areco, Inc.

678-1500 (Area Code 312)

9370 Byron Street
Schiller Park, Ill.

Circle 521 on Inquiry Card

ECH SPECIAL

Gallon Line Available, Horix 9 spt. Filler, Resina
Capper, Pneumatic Scale Labeler, taked Glass, Tin
& Plastic. Rebuilt Price—\$10,000.00.

EQUIPMENT CLEARING HOUSE, INC.

429 39 Street, Brooklyn, N. Y. 11232
Code 212 438-5020-21

Circle 522 on Inquiry Card

BEST OFFERINGS

SPRAY DRYERS: Blaw-Knox stainless 750#/hr.;
Mojonnier 1200#/hr. stainless.
DOUBLE DRUM DRYERS: (4)42" x 120" Blaw-
Knox 160 PSI, work press; also (2)36" x 120",
32" x 120", 36" x 84".
EVAPORATORS: (All stainless steel) 1823 sq. ft.
Blaw-Knox double effect recompression; Mojonnier
2152 sq. ft. quadruple effect falling film with
recompression; Mojonnier 5329 sq. ft. Double Effect
LOW-TEMP; Five double effect units 1311-1050-
850-708-608 sq. ft. each.
STAINLESS STEEL SANITARY TANKS: 17,000-
6500-5000-4000- (2)3000-2500- (2)750 gal.
storage tanks; 3000-2000 gal. cold wall tanks.
CENTRIFUGES: All Stainless; DeLaval's PX213
and BRPX309; Sharples nozzlejetor BD-2080.

MANY MORE ITEMS

BEST EQUIPMENT COMPANY, INC.

1737 W. Howard St., Chicago, Ill. 60626
Phone (312) 262-1452

Circle 523 on Inquiry Card

FOR SALE OR RENT B & W BOILER

200,000 lbs./hr.—1000 PSI
RE-BUILT — GUARANTEED

DUAL FUEL

DIESEL GENERATOR

1563 KVA — 2400 volts

RE-BUILT — GUARANTEED

OTHERS: 100 KW TO 2000 KW

TURBINE GENERATOR

750 KW — 480 VOLTS

250 PSI — 50 PSI EXTRACTION

OTHERS UP TO 66,000 KW

PACKAGE BOILERS

ALL SIZES AND PRESSURES
BOUGHT — SOLD — RENTED

WANTED

PACKAGE BOILERS

STEAM TURBINE GENERATORS

GAS TURBINE GENERATORS

DIESEL GENERATORS

SINGLE UNITS OR ENTIRE PLANTS

NON-CONDENSING TURBINE GENERATORS

KW	INLET	EXHAUST	VOLTAGE
15,000	600 PSI	140 PSI	13,800
5500	600 PSI	150 PSI	2400
1250	525 PSI	10 PSI	2400
1000	400 PSI	5 PSI	480
500	400 PSI	5 PSI	480

Call Murray Grainger (201) 743-8700

CAPITAL EQUIPMENT

P.O. Box 591-FE, Bloomfield, N.J. 07003

Circle 514 on Inquiry Card

PMS Co. for BEST REBUILT EQUIPMENT

40' s/s SCREW CONVEYORS 6"; FILLERS; WASHERS;
EVAPORATORS; HOMOGENIZERS (75 to 2500 gph);
PROCESSORS (30 to 800 gal); COMPRESSORS (freon
& ammo); STORAGE TANKS (insul, refrigerated—50
to 15,000 gal); KETTLES (50-200 gal. scraper agi-
tator); CENTRIFUGES; HEAT EXCHANGERS (tubular
or plate); PUMPS; S/S FITTINGS; TUBING & VALVES;
FISH STICK CUTTER (30,000 sticks per hour).

PROCESSING MACHINERY & SUPPLY CO.

1108 Frankford Ave., Phila., Pa. 19125
(215) 423-5603

Circle 515 on Inquiry Card

ONE-STOP MACHINERY HEADQUARTERS

JOZOVICH MFG.

1793 Lafayette St.
Santa Clara, Calif. 95050

Telephone
(408) 296-6040

65 COOKERS AND COOLERS
22 MILLS AND DISINTEGRATORS
30 EVAPORATORS
70 FILLERS, all types
38 CLOSERS; Angelus, CANCO, CCC

Our theory about inventories is this: it's not how large you make them, but how you make them large. So although we do have one of the largest inventories anywhere (7 acres), you'll also find it one of the most up-to-date. (See examples above.) So whatever your equipment needs, new or used, check with us first.

SEND FOR COMPLETE CATALOG

YOUR IDLE EQUIPMENT IS IN DEMAND NOW!

This is the time of year when demand for used food processing equipment hits its peak. We can help you cash in on this by finding buyers for you, or by purchasing outright for our own stock. Why not make up a list of your idle machinery (with prices) today, and send it to us? We promise a prompt reply.

• COMPLETE PLANTS • INSTALLATIONS • ENGINEERING

Circle 524 on Inquiry Card

the NEW LOOK in USED MACHINERY

WE WANT TO BUY

WE ARE IN IMMEDIATE NEED OF THE FOLLOWING CLOSING MACHINES:

Angelus 59-P & 50-P for #10's
Angelus 60-L
Angelus 40-P
Angelus 69-P
Continental 334-CR-P4, P7 or 415
Continental 220 VDS
Continental 5C clincher

Continental 81C clincher
Continental PDS for #10's
American 400
American 300, 300B or 402 EV
American 08 for #10's
American 006
American 05 for #10's

Call Don Pateman at (415) 467-3400
He'll pay top dollar.



MACHINERY & EQUIPMENT CORP.

P.O. BOX 3132 F • SAN FRANCISCO • CALIFORNIA 94119

Circle 525 on Inquiry Card

boilers sale or lease

IMMEDIATE DELIVERY ON PACKAGE BOILERS
WABASH POWER EQUIPMENT CO.
2701 W. PETERSON AVE., CHICAGO, ILL. 60645
PHONE (312) 271-9600

Circle 526 on Inquiry Card

FOR SALE

2—Areneo Mod. G.A.B. Tube Fillers
3—N. J. Labelers 86 ML & MLX
1—Resina Mod. S. Capper (up to Gal Size)
15—S/S Kettles 60, 80, 100 & 200 Gal.
3—Waukesha Mod. 55 Sni Pumps.
**TANKS, PUMPS, MIXERS, BLENDERS,
ETC. ALL SIZES IN STOCK. WE ARE
ANXIOUS TO BUY YOUR SURPLUS.**
KEITH MACHINERY CORP.
73-15th St., B'klyn, N. Y. ST. 8-5502

Circle 527 on Inquiry Card

TYING MACHINES

MAILERS TYTE-TYERS

The strongest, tightest tyers of anything including wood and steel. Can tie in single wrap, or single cross wrap or double wrap. Ties up to 52" wide and 34" high.

MAILERS TYING MACHINES, INC.
40 WEST 15TH ST., N.Y., N.Y. 10011

Circle 528 on Inquiry Card

FIRST

IMMEDIATE DELIVERY AND GREAT SAVINGS ON PROCESSING AND PACKAGING EQUIPMENT

Stainless Dryers-Evaporators
Reactors, Kettles, Tanks, all sizes.
Fillers by Pfaudler, Elgin, Hope.
Stokes & Smith Auger Type Fillers.
Cappers by Resina, Pn. Scale others.
Pn. Scale Streamlined Hi Speed
Front & Back Duplex Labelers.
Wrap Around Labelers by Standard
Knapp, Burt, New Way others.
Sprout Waldron 5,000 Cu. Ft. SS Blender.
3 Sprout Waldron 5,200 Cu. Ft. Alum.
Blending Silos 12' x 45' complete.
St. Knapp Aut. Gluers & Sealers.
ABC Model GL Aut. Unloader-Unscrambler.

Send for Complete List
of Packaging Equipment

First Machinery Corp.

209 289 10th Street, Brooklyn, N.Y. 11215
Tel. (212) ST 8-4672 • Cable EFFEMCY

Circle 529 on Inquiry Card

PRESERVE COOLER

50' x 6' with infed conveyor and pusher bar—2 water storage tanks, 2 pumps, cyclone conveyor chain. \$2,000.00.

CLEMENTS FOODS CO.

Box 14158, Okla. City, Okla. 73114

Circle 530 on Inquiry Card

Help Wanted

ASEPTIC OPERATOR

Good opportunity in growing company in Aseptic canning. Knowledge of operation involving James Dole canning equipment, swept surface and steam injection sterilization equipment necessary. Salary commensurate with experience. Location Eastern U. S. A.

Write: Sol Zausner, Pres.

ZAUSNER FOODS CORPORATION

Box 1146, Mountainside, N. J. 07092

MECHANIC: Good opportunity for the right man with an established and growing pet food company. Must be thoroughly experienced in all phases of canning machinery. Salary commensurate on experience and ability. Box FE-544, c/o FOOD ENGINEERING, Chestnut & 56th Sts., Phila. 19139.

A JUNIOR DEVELOPMENT ENGINEER

is required to originate and help carry out improvements to confectionery plant and processes at our Forest Gate Factory.

A self-starter in his early twenties, he will have HNC (Mech. E) or equivalent, and two years' engineering/design food processing and/or packaging experience.

A regularly reviewed salary is offered, with non-contributory pension, profit share and other benefits; together with opportunities for training and advancement in our Group's expanding international operations.

For an application form 'phone 01-472 0172 or write to: General Works Manager,

TREBOR SHARPS LTD.

Katherine Road London E.7, England

Help Wanted

PROJECT MANAGER

\$14-\$16,000

To supervise installation and start-up of packaging line in expanding food plant. When installation is complete man will become Packaging Manager for entire plant, with further promotional potential in line responsibility (Production, Plant management) or in corporate staff assignments.

Plant is divisional headquarters for major conglomerate which offers, bright, profitable futures to productive management personnel.

Send resumes, with salary history, to:

JACK STANTON

Spaulding Associates

111 N. Wabash Ave.

Chicago, Ill. 60602

312-782-5920

CHEMISTS

FOOD TECHNOLOGISTS

We have need for recent graduates as well as food chemists with appropriate experience for research positions in our expanding product development group. This is an excellent opportunity with a sound and progressive company located in the Princeton, N. J. area. Generous company benefits including education assistance.

Send confidential resume including salary history and requirements to Personnel Manager,

FRENCHETTE

Division of Carter-Wallace, Inc.

Cranbury, N. J. 08512

An Equal Opportunity Employer

SALES ENGINEER

Rapidly expanding food processing machinery manufacturer needs self starter who thrives on challenges. Must be capable of selling, computing costs of installation, and calculating savings in production costs anticipated by use of company's machinery. Involves process analysis, bid preparation and direct customer contact. Send complete resume, including present earnings and anticipated earnings to:

P. O. Box 1350

Sandusky, Ohio 44870

PLANT MANAGER

An established fruit processing company is seeking the services of a man to manage their plant in south-western Michigan. Knowledge of fruit processing, fruit chemistry and operation is essential.

When writing, please submit complete resume including expected salary.

Job benefits include paid group insurance and vacations.

BOX FE-540

c/o Food Engineering, Chestnut & 56th Sts., Phila. 19139

An Open Letter

To The Best

Frozen Food Production Mgrs.

In The Industry

Are you a top frozen food production manager?

If so, please read on.

Tired of working for a billion dollar colossus, where in spite of what you're told at annual management meetings, you spend the other 364 days each year feeling like a small cog being ground to death (or inertia) by the overbearing corporate machinery?

Ever look introspectively at yourself and ask what you are doing investing your God-given talents in a huge impersonal corporate being, where form is more important than content and your corporate colleagues are infected with one of the several bureaucratic "itises" such as meetingitis, report writingitis, conferenceitis (and its deadly variant—seminaritis)?

All these diseases are common in multi-billion dollar corporations and yet some people, many perhaps, are comfortable, and maybe even happy (sic) there. If you are, so be it, rest in peace, you're not for us.

HOWEVER, if you've ever itched for real responsibility in a medium size company (under \$50 million), and for an opportunity to really run something, we'll give you your chance. If you have a university degree, any course, plus a high degree of initiative, the ability to organize and motivate, and handle men well, why waste these talents? Invest them with us, and harvest the dividends.

We're an aggressive frozen food company with a fantastic growth record. We're 11 years young, entrepreneurially inclined and very, very hungry.

Here are the jobs:

JOB #1—PRODN. MGR.—POTATO PROCESSING PLANT

JOB #2—PRODN. MGR.—FROZEN PREPARED FOODS PLANT

Direct experience in one of these fields would be a distinct asset. Salary level is open; but very, very competitive. Company pension and liberal benefits package. Relocation expenses paid, of course.

Tired of the corporate rat race? Then come and grow with us.

One more thing, we're located in a beautiful rural area near the Eastern seaboard. It's a great place to raise children with miles of ski-doo trails, good skiing, curling and all kinds of deer, partridge, rabbit plus an abundance of native brook trout. You're less than an hour from fabulous cottage country with excellent boating and inexpensive waterfront lots. But, you're in the country. Shopping is nearby, but there are no shopping centers on your doorstep. Some people thrive in that environment.

If your family could enjoy the quiet taste of the country, while you get your teeth into a one-of-a-kind growth opportunity to become a major participant in a young management team, please write today. Do you feel you are one of the best production managers in the frozen food industry today? If so, please consider investing those talents in my company where the rewards in real job satisfaction and financial return will be more in keeping with your true contribution.

If you are genuinely motivated by this advertisement, I'd like to meet you. Please write me today, sending details of your education, job experience, earnings record and phone number to:

The President

Aggressive, Medium-Size Food Company

Box FE-549

c/o Food Engineering

Chestnut & 56th Street, Philadelphia, Penna. 19139

An Equal Opportunity Employer

If You Are a Great, Young, New Product Man in Soft Drinks, Here Is . . .

A GREAT NEW JOB!!

With a Fine Old Company . . . Recently Merged for Growth . . . New Capital . . . New Dynamic Management . . . Already Doing Big New Things in Industry.

You Would Be Senior Man for All Product Activities:

Production
New Products
Technical Services

Salary Open & Fringe Benefits

Write Complete Details. All Replies Held Confidential.

BOX FE-548

c/o FOOD ENGINEERING, Chestnut & 56th Sts., Phila., Pa. 19139

CAREERS IN FOODS

PLANT MANAGERS (3) To \$20,000

BAKERY—SNACKS—CANNING.

Degree plus experience and knowledge of food manufacturing, purchasing, engineering, etc. Officer potential in several years.

QUALITY ASSURANCE To \$15,000

Degree and 5 or 6 years experience. Knowledge of computer application information. Potential for responsible management position. Knowledge of S.Q.C.

INDUSTRIAL ENGRS. (8) \$9 to \$15,000

Knowledge of food industry methods, yield control and material handling and labor.

CHEMISTS (15) \$7 to \$22,000

Research and plant level, many specialists and generalists needed.

ENGINEERS (3) To \$14,000

1. Industrial
2. Design
3. Facilities

NEW
DEPARTMENT

ENGINEERS (12) \$9,000 to \$15,000

Design, packaging, plant or processing with background in food handling systems.

CLIENT COMPANIES PAY ALL FEES, RELOCATION AND INTERVIEW EXPENSES.

Please send background, salary requirements and location preference for these and many other opportunities in the Food Industry.

Mr. Thomas Light

S-H-S INTERNATIONAL

Two Bryn Mawr Avenue, Bryn Mawr, Pa.

(215) 527-1350

Professional Services

Engineering—Economic Consulting Services

FOR THE FOOD PROCESSING INDUSTRY

Feasibility Studies • Facility Analyses
Plant Location Surveys • Material Handling and Distribution Studies



THE AUSTIN COMPANY
Designers • Engineers • Builders

GENERAL OFFICES: CLEVELAND, OHIO 44121
Offices in Principal Cities

Situation Wanted

PRODUCTION OR QUALITY CONTROL—Desire position with fruit processing company or related field. Experienced in the production of frozen and processed fruits. Box FE-547, c/o FOOD ENGINEERING, Chestnut & 56th Sts., Phila. 19139

PROCESS EQUIPMENT SALES ENGINEER

Eastern manufacturer of food and industrial heat exchange and allied processing equipment has opening for a sales engineer to cover the greater New York City area.

Old, firmly established company . . . a pioneer in the Dairy Industry . . . now, for many years, much more active in Food Processing and Industrial fields.

Interesting, diversified and rewarding work operating in the highest sales potential area . . . proximity of our factories and headquarters and imaginative engineering provide excellent back-up . . . rest is up to your own flexibility.

Salary plus commission and expenses. All replies will be held in strict confidence.

BOX FE-539

C/O FOOD ENGINEERING

Chestnut & 56th Sts., Phila. 19139

FE NEEDS EDITOR

FOOD ENGINEERING needs an additional editor. Unusual opportunity for recent graduate with training in food technology or chemical engineering, or with knowledge of food manufacturing. Aptitude for writing essential. Position involves interesting work, occasional travel, and outside contacts. It assures professional development. Location, Philadelphia. Write to

Frank K. Lawler, Editor, Chestnut & 56th Sts.
Philadelphia, Pa. 19139

Employment Services

PROFESSIONAL PLACEMENT SPECIALISTS SERVING

FOOD INDUSTRY PERSONNEL

Confidential resumes (or letter) to R. C. Myers. We will respond to your inquiry within three days. Our clients pay all fees & expenses.



FOX-MORRIS ASSOCIATES

Personnel Consultants

1500 Chestnut St. Phila., Pa. 19102
(215) LO 1-6300
PAN AM BLDG.
200 Park Avenue, N. Y., N. Y. 10017

Career Conscious?

Send us your resume. We specialize in upgrading your career — selectively and confidentially with our client companies in food industry. Company pays fee.

Director, Food Industry Dept.

AAA EMPLOYMENT RESEARCH

162 N. State St., Chicago, Ill. 60601
(312) 726-5183

ADVERTISERS IN THIS ISSUE

This index is published as a convenience. No liability is assumed for errors or omissions.

A A A Employment Research	144
A/S Niro Atomizer	137
A/S Atlas (Int'l Edition)	2-A
Aaron Equip. Co., Div. of Areco, Inc.	141
Aeroglide Corp.	127
Airco Industrial Gases	45
Allen-Bradley Co.	49
Aluminum Company of America	6-7
American Machinery Corp., Div. Aeroglide Corp.	126
American Standard, Heat Transfer Products Dept.	119
Angelus Sanitary Can Machine Co.	98
Atlas Chemical Industries, Inc.	39
The Austin Co.	144

B.I.F., A Unit of General Signal Corp.	122
Best Equipment Co.	141
Borden Foods Co., Canning Machinery Div.	16
Box Elder County Utah, Industrial Commission	123
Brill Equipment Co.	141

DeLaval Separator Co.	38
DeLaval Separator Co., G & H Products	57
Detecto Scales, Inc.	138
Dimco-Gray Co.	116
Dodge Mfg. Corp., Div. of Reliance Electric Co.	108
Drehmann Paving & Flooring Co.	120

California Almond Growers Exchange	105
Capital Equipment Enterprises, Inc. ..	141
Carter-Day Co.	92
Centrico, Inc.	140
Chisholm-Ryder Co.	26
J. B. Choate	145
Cleaver Brooks	48
Clements Foods Co.	142
Continental Engineering (Int'l Edition)	2-D
Corn Products Co.	8, 19, 107
Custom Processing Corp.	145

E. I. DuPont de Nemours & Co., Explosives Dept.	88
Equipment Clearing House, Inc.	141

FMC Corporation, Avistrap Div.	14
FMC Corporation, Link-Belt Div.	5
Fast Flo Corp.	141
Charles S. Feld	141
Fenco, Inc.	132
First Machinery Corp.	142
Fogg Dairy Sales	141
Food Processing Machinery & Supplies Assoc.	118
Foremost Foods Co.	44
Foxboro Co.	111
Frenchette, Div. of Carter-Wallace, Inc.	143
Fuller Co., General American Transportation Corp.	33

Contract Manufacturing

BREAD CRUMBS BAKED — TOASTED

For Food Processors, Meat Packers,
Packagers, Etc. Volume Producer
with "Wenger Continuous Process."
Arizona Shipping Point.

Inquiries solicited

THUNDERBIRD FOODS, INC.

P.O. Box 249, Sabetha, Kans. 66534
913-284-2133

Circle 531 on Inquiry Card

PRIVATE LABEL CUSTOM PROCESSING!

All dry mixes — bakery, institutional,
etc. • Your formulas or ours • Modern
plant • Experienced technologists •
Modern laboratory facilities — both
quality control and research • Non-
competitive accounts • Full confi-
dence maintained • Now serving lead-
ing manufacturers. Write:

Philip W. Orth

PH. ORTH COMPANY

Established 1882 / Milwaukee, Wis. 53204

Circle 532 on Inquiry Card

COFFEE BUYERS

Brazilian Industrial who will produce six million
pounds per annum of Freeze-Dried instant coffee,
is looking for prospective buyers. Inquiries with:

J. B. CHOATE

P. O. Box 1305

Sao Paulo, Brazil

Circle 533 on Inquiry Card

Contract Manufacturing

SPRAY DRYING

Done On Custom Basis
Evaluation and Contract Drying

CUSTOM PROCESSING CORP.

11 East 6th Ave., Trenton, N.J. 08619
Phone (609) 587-5770

Circle 534 on Inquiry Card

BREAD CRUMBS DRIED—TOASTED

For Food Processors, Packagers,
etc. Volume Producers in Bulk.
Packaged in 50 lb. Bags. Inquir-
ies solicited.

GOURMET TOAST CORP.

345 Park Avenue, Brooklyn, N.Y. 11205
212-852-4536

Circle 535 on Inquiry Card

German American Chamber of Commerce	120
Germantown Manufacturing Co.	103
Givaudan Corp.	58
Gourmet Toast Corp.	145
W. R. Grace & Co., Davison Chemical Div.	36
Greco N.V. (Int'l Edition)	2-C

Hercules, Inc., Haskon Div.	28
Hoffmann-LaRoche, Inc.	125
S. Howes Co., Inc.	121

A. E. Illes Co.	116
Industrial Products Group Schwitzer..	43
Industrialexport (Int'l Edition)	2-G

Jamison Door Co.	21
Jeffrey Manufacturing Co.	35
Joy Manufacturing Co., Electrical Products Div.	22
Jozovich Mfg.	142

ADVERTISERS IN THIS ISSUE

Lester Kehoe Machinery Corp.	141
Keith Machinery Corp.	142
Kelco Co.	11
King Co. of Owatonna	132
Klenzade Products	15
Koch Supplies	32

Ladish Co., Tri-Clover Div. Inside Front Cover	
Lanico Maschinenbau, Otto Niemisch KG (Int'l Edition)	2-B
LaPorte Mat. & Mfg. Co.	117
Leavitt Corp.	141

Mailers Equip. Co. Inc.	142
Machinery & Equipment Corp.	142
Mixing Equipment Co., Inc.	134
Fox-Morris Associates	144
Paul Mueller Co.	46

Niagara Blower Co.	112
Norda	Back Cover

Oakite Products Inc.	136
---------------------------	-----

Peco Corp.	30
Pennsalt Chemicals Corp.	52
Perry Equipment Corp.	133
Pfautler Co.	47
Ph. Orth Co.	145
Pittsburgh Corning Corp.	97
Processing Machinery & Supply Co. ..	141
Proctor & Schwartz, Inc.	100

E. P. Remy & Cie.	124
Rheem Manufacturing	50
Rietz Manufacturing Co.	113
Robertshaw Controls Co.	34

S-H-S International, Div. of Schneider, Hill & Spangler	144
Sandvik Steel, Inc.	139
Sarco Co., Inc.	10
W. A. Scholten's Chemische Fabrieken N.V. (Int'l Edition)	2-H
Sealright, Div. of Phillips Petroleum	54-55
Sheffield Chemical	53
Henry Simon Ltd. (Int'l Edition)	2-B
Spaulding Associates	143
Spraying Systems Co.	130
Star Tank & Filter Corp.	130
Stearns-Roger Corp.	104
Systems Engineering & Manufactur- ing Co.	56

Takeda U.S.A., Inc.	93
Thunderbird Foods, Inc.	145
Toledo Scale Co.	94
Trebor Sharps Ltd.	142
W. S. Tyler Co.	18

U.S. Import Equipment Distributors, Inc.	97
U.S. Stoneware Inc.	106
Unitechna (Int'l Edition)	2-F
United States Steel Corp.	37
Urschel Laboratories Inc.	42

Vanmark Corp.	96
Votator Div., Chemetron Corp. Inside Back Cover	

Wabash Power Equipment Co.	142
Wallace & Tiernan Inc.	4
Warner-Jenkinson Mfg. Co.	31
Wenger Mixer Mfg. Co.	20
Werner Machinery Co.	12
White Cap Co., Div. of Continental Can Co.	128-129
Wiegand Apparatebau GmbH (Int'l Edition)	2-E
State of Wisconsin, Dept. of Economic Development	131
Wyandotte Chemical Corp.	110

Zausner Foods Corp.	142
--------------------------	-----

FOOD ENGINEERING BUSINESS STAFF

EXECUTIVE OFFICE—PHILADELPHIA

GRAHAME E. RIDDELL...PUBLISHER

DAVID P. HUGHES, JR. Marketing Director
RICHARD B. LAIMBEER...Marketing Services Ass't
ARTHUR L. BURNS Circulation Mgr.
WILLIAM LAIMBEER Census Director
WARREN OWENS Production Director
WALLACE ROOT Production Manager
JANE STICKLEY Production Ass't

DISTRICT SALES OFFICES

ATLANTA 30309 John Sangston
1776 Peachtree St., N. W. 404-875-1255
CHICAGO 60606 Cliff Mitchell, Bob Clark
120 S. Riverside Plaza 312-782-1400
CLEVELAND 44114 Bill Weber
Investment Insurance Bldg. 216-781-2860
DALLAS 75206 Hal Mott
189 Meadows Bldg. 214-363-6426
HOLLYWOOD, FLA. Frank Smith
2419 Hollywood Blvd. 305-927-7829
HOUSTON 77027 John Wallace
4848 Guiton 713-621-3428
LOS ANGELES 90015 Jack Kay
1543 W. Olympic Blvd. 213-387-1271
NEW YORK 10017 Frank McCarthy, Ted Meredith
100 East 42nd St. 212-697-3400
PHILADELPHIA 19139 Jack Miller
Chestnut & 56th Sts. 215-748-2000
SAN FRANCISCO AREA Frank McKenzie
839 Mitten Road, Burlingame 94010 415-697-8703
LONDON, S.W. 1, England ...Max F. Holsinger
67/68 Jermyn St., St. James TRAFalgar 6318
MANCHESTER 22, England D. Ian Goulden
Haletop, Civic Centre Wythenshawe MCurry 3293
DUSSELDORF, Germany E. Hillerbrand, H. Halbt
Eitelstrasse 32, United Inter. Ind. Press
Dusseldorf 632031
PARIS 8^e, France Stephen Brown-Joussard
70 Rue de Ponthieu Elysees 65-77
TOKYO, Marunouchi, Japan ...C. T. Sakaguchi
C.P.O. Box 1572 Tel. 211-3506-3509

Ideal Sanitary Lubricating Spray for
ALL FOOD PROCESSING EQUIPMENT

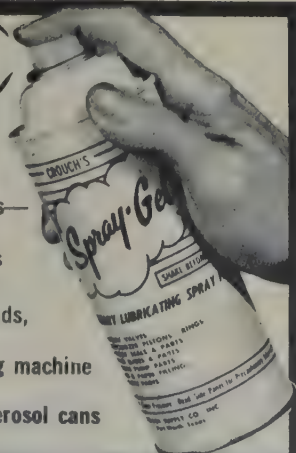
Spray-Gel®

Pure, sanitary, odorless, tasteless, non-toxic . . . will not gum, bleed or separate. Contains no animal, vegetable fats, solid petroleums, soap or metals. Will not contaminate or taint food products. Works in wet or dry conditions . . . protects from rust, corrosion. Meets with the approval of Health Depts. and Sanitation Officials — conforms with U. S. Public Health Service Recommendations.

FOR USE ON:

- All valves
- Homogenizer pistons—rings
- Rotary seals & parts
- Positive pump parts
- Stainless steel threads, surfaces
- Glass & paper filling machine parts

PACKED: 12/16 oz. aerosol cans
per case



CROUCH SUPPLY CO.

305 SOUTH MAIN STREET
P. O. BOX 906
FORT WORTH, TEXAS 76101

For More Information

Each advertisement and new product description in this journal carries a code number. For more information about any item, circle that number on the postcard below. Be sure to *print your name, company, etc.*, on the reverse side of the card in *block letters* and affix a stamp. Card is valid for three months only.

Für weitere Auskunft

In dieser Zeitschrift ist jede Anzeige und jede Beschreibung eines neuen Erzeugnisses mit einer Kennziffer versehen. Um weitere Auskunft über irgend einen Gegenstand zu erhalten, ist es notwendig, die zutreffende Nummer auf der nachfolgenden Postkarte zu umkreisen. Vergessen Sie bitte nicht, *Ihren Namen, Firma, usw.* auf der Rückseite der Karte in *Blockschrift* anzugeben und eine Briefmarke aufzukleben. Die Postkarte ist *nach drei Monaten ungültig*.

Comment obtenir davantage de renseignements

Dans cette revue, chaque annonce et chaque description de matériel nouveau comporte un numéro de code. Si vous désirez recevoir davantage de renseignements au sujet de n'importe quel matériel annoncé ou décrit il vous suffit d'encercler le numéro qui convient sur la carte ci-dessous. Au verso, veuillez écrire en *lettres moulées* le nom de votre firme, votre nom, etc. Envoyez-nous la carte, après l'avoir affranchie, dans un délai de trois mois.

Para más información

Todo anuncio y toda descripción de un nuevo producto llevan un número de clave. Márquense con un círculo los números de la tarjeta postal siguiente, si se desea más información. Asegúrese de escribir el nombre, la compañía, etc. en *letras de molde* al dorso de la tarjeta y de pegarle un sello de correo. La tarjeta es *válida sólo por tres meses*.

Empresa:

Firme:

Firma:

Firm:

Nombre:

Nom:

Name:

Name:

Cargo:

Titre:

Titel:

Title:

Dirección:

Adresse:

Adresse:

Address:

Pays:

Country:

Land:

City:

Produit:

Produit:

Erzeugnis:

Product:

How many workers in your plants? Wie viele Arbeiter in Ihren Werken? Combien d'ouvriers dans vos usines? ¿Cuántos obreros en vuestras fabricas?

☐ NO

☐ YES

Do you wish to receive Food Engineering FREE?

Signature:

MANAGER, READER SERVICE

FOOD ENGINEERING

CHILTON CO.

U. I. I. P.

67/68 Jermyn St.

ST. JAMES'S

LONDON, S.W. 1

ENGLAND

This card good if posted within 3 months after: (12/68)

Diese Karte ist gültig 3 Monate nach:

Pour être valable, cette carte doit être postée dans les 3 mois:

Esta tarjeta deberá ser remitida dentro de 3 meses después de:

• Please send me more information about the items circled below.

• Bitte senden Sie mir weitere Auskunft über die unten mit einem Kreis gekennzeichneten Objekte.

• Veuillez me faire parvenir de plus amples renseignements sur les sujets marqués d'un cercle ci-après.

• Por favor mándame mas información sobre los asuntos designados abajo con un círculo.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112
113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128
129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176
177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192
193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208
209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224
225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256
257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272
273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288
289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304
305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320
321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336
337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352
353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368
369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384
385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416
417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432
433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448
449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464
465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496
497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512
513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528
529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544
545	546	547	548	549	550	551	552								

For More Information

Each advertisement and new product description in this journal carries a code number. For more information about any item, circle that number on the postcard below. Be sure to print your name, company, etc., on the reverse side of the card in block letters and affix a stamp. Card is valid for three months only.

Für weitere Auskunft

In dieser Zeitschrift ist jede Anzeige und jede Beschreibung eines neuen Erzeugnisses mit einer Kennziffer versehen. Um weitere Auskunft über irgend einen Gegenstand zu erhalten, ist es notwendig, die zutreffende Nummer auf der nachfolgenden Postkarte zu umkreisen. Vergessen Sie bitte nicht, Ihren Namen, Firma, usw. auf der Rückseite der Karte in Blockschrift anzugeben und eine Briefmarke aufzukleben. Die Postkarte ist nach drei Monaten ungültig.

Comment obtenir davantage de renseignements

Dans cette revue, chaque annonce et chaque description de matériel nouveau comporte un numéro de code. Si vous désirez recevoir davantage de renseignements au sujet de n'importe quel matériel annoncé ou décrit il vous suffit d'encrer le numéro qui convient sur la carte ci-dessous. Au verso, veuillez écrire en lettres moulées le nom de votre firme, votre nom, etc. Envoyez-nous la carte, après l'avoir affranchie, dans un délai de trois mois.

Para más información

Todo anuncio y toda descripción de un nuevo producto llevan un número de clave. Márquense con un círculo los números de la tarjeta postal siguiente, si se desea más información. Asegúrese de escribir el nombre, la compañía, etc. en letras de molde al dorso de la tarjeta y de pegarle un sello de correo. La tarjeta es válida sólo por tres meses.

FOOD ENGINEERING

This card good if posted within 3 months after: (12/68)

Diese Karte ist gültig 3 Monate nach: Pour être valable, cette carte doit être postée dans les 3 mois: Esta tarjeta deberá ser remitida dentro de 3 meses después de:

- Please send me more information about the items circled below.
- Bitte senden Sie mir weitere Auskunft über die unten mit einem Kreis gekennzeichneten Objekte.
- Veuillez me faire parvenir de plus amples renseignements sur les sujets marqués d'un cercle ci-après.
- Por favor mándeme mas información sobre los asuntos designados abajo con un círculo.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112
113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128
129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144
145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176
177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192
193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208
209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224
225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256
257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272
273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288
289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304
305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320
321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336
337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352
353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368
369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384
385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416
417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432
433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448
449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464
465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496
497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512
513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528
529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544
545	546	547	548	549	550	551	552								

MANAGER, READER SERVICE

FOOD ENGINEERING
CHILTON CO.
U. I. I. P.
67/68 Jermyn St.
ST. JAMES'S
LONDON, S.W. 1
ENGLAND

☐ ON ☐ YES ☐ FREE Do you wish to receive Food Engineering FREE?
Signature: _____

☐ How many workers in your plants?
Werken? Combien d'ouvriers dans vos usines?
en vuestras fabricas?

Producto: _____
Produit: _____
Erzeugnis: _____
Product: _____

City: _____
Stadt: _____
Ville: _____
City: _____

Dirección: _____
Adresse: _____
Adress: _____
Address: _____

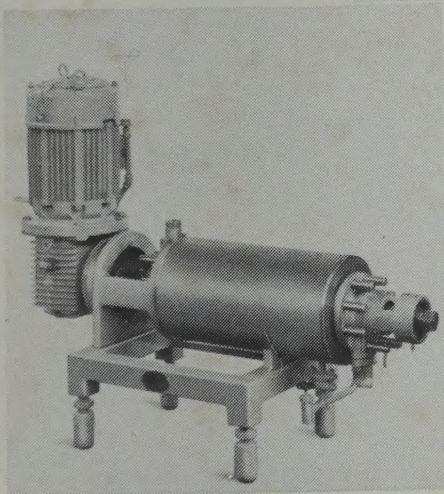
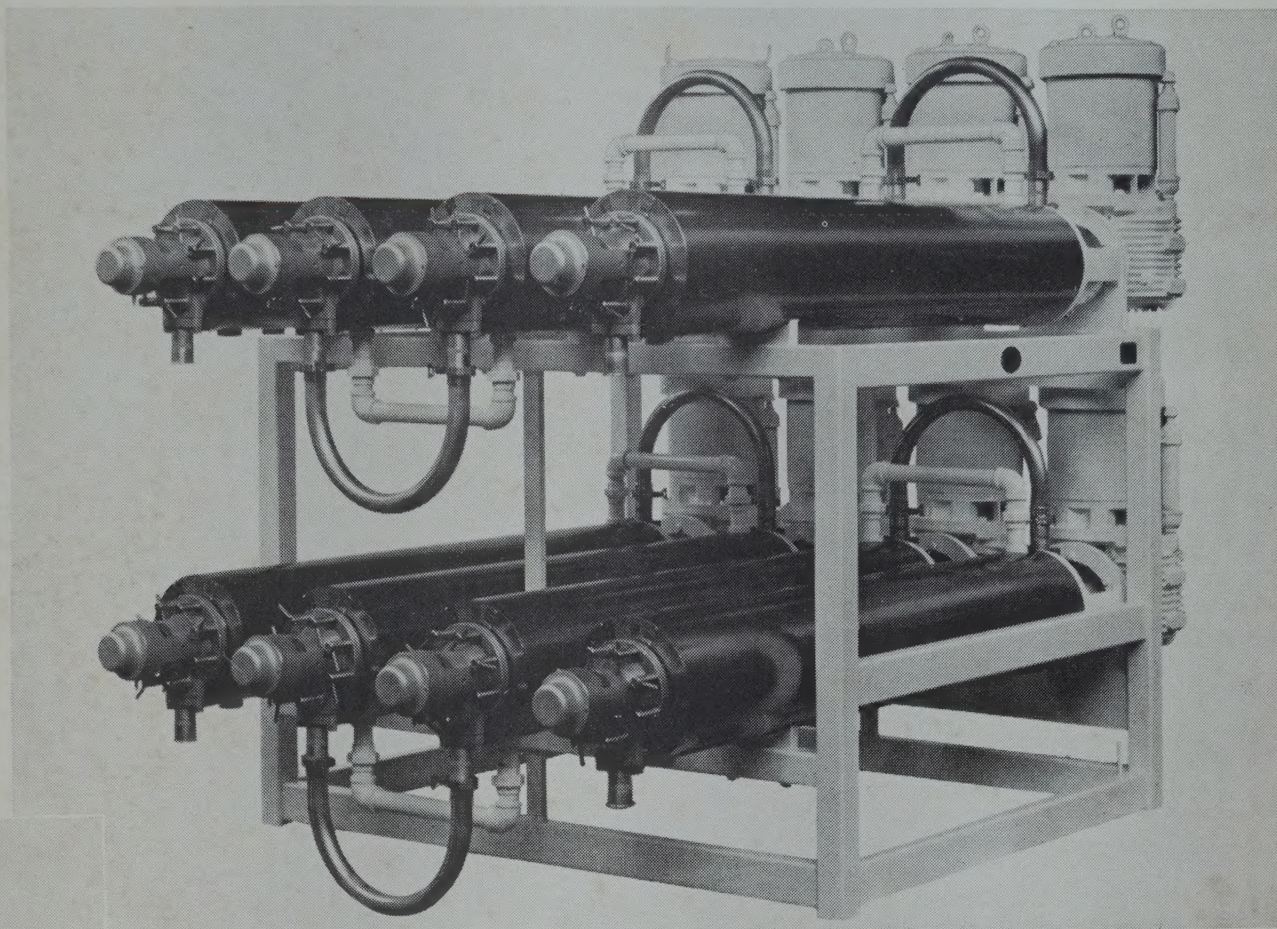
Cargo: _____
Titre: _____
Titel: _____
Title: _____

Nombre: _____
Nom: _____
Name: _____
Name: _____

Empresa: _____
Firma: _____
Firma: _____
Firm: _____



Scraped Surface Processors Matched To Your Product



From the single 6" x 24" model to the eight-cylinder 6" x 72" unit illustrated above, VOTATOR Scraped Surface Heat Exchangers meet any requirement for economical, controlled continuous processing. If your products can be pumped, they can also be continuously processed at constant output rates and temperature to protect product flavor, color and texture. Applications include:

Gelation; salad dressing, pie filling, custard, gumdrops, gelatin

Sterilization or Cooking; starch, meats and meat products, cream style corn, soups, baby foods, beef stews, gravies, tomato paste, pet foods

Crystallizing or Texturizing; lard, shortening, margarine, peanut butter, chocolate fudge, fondant, icings, sandwich creme, honey, process cheese, grain marshmallow, monoglycerides

Slush Freezing or Freeze Concentrating; citrus and fruit juices, eggs, vinegar, flavors and extracts, coffee

Ask for Technical Bulletin 12.3163-M-14 and 09.2061-R1-M-14 which provide complete information on how a Votator Scraped Surface Heat Exchanger will match your requirements, improve your product and save you money . . . Votator Division, Chemetron Corporation, Louisville, Kentucky 40201.



PROCESSING EQUIPMENT

ANOTHER **CHEMETRON** PRODUCT

TRADEMARK

There's no room for doubt



Cherries vary. Some are wild. Some are sweet. But any cherry's the very best, when it comes from Norda. Matter of fact, next to nature's own, Norda flavors are truest. And in the best of taste.

*Our quest for perfection
never ends*

Norda

*makes good scents and flavors
all over the world.*

NORDA, 475 Tenth Avenue, New York, N. Y. 10018 ☐ Telephone: 212-594-3232 • Cable Address "NORDOIL," New York ☐ EXCLUSIVE BASIC MATERIALS for Scented and Flavored Products: Write or wire for specific information on your requirements ☐ Offices in Chicago, Dallas, Los Angeles, San Francisco, Toronto, Montreal and other worldwide offices through Norda/Schimmel International in Australia, Canada, England, France, Germany, Greece, India, Italy, Japan, Norway, Pakistan, Spain, Sweden, Switzerland, Thailand, Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Philippine Islands, Puerto Rico, Paraguay, Peru, Uruguay, Venezuela.

Circle 3 on Inquiry Card